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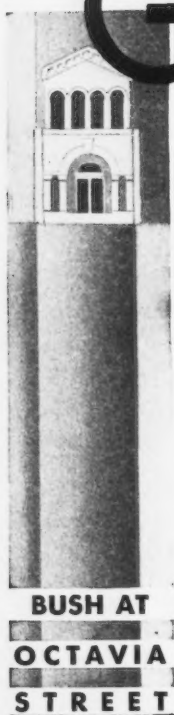
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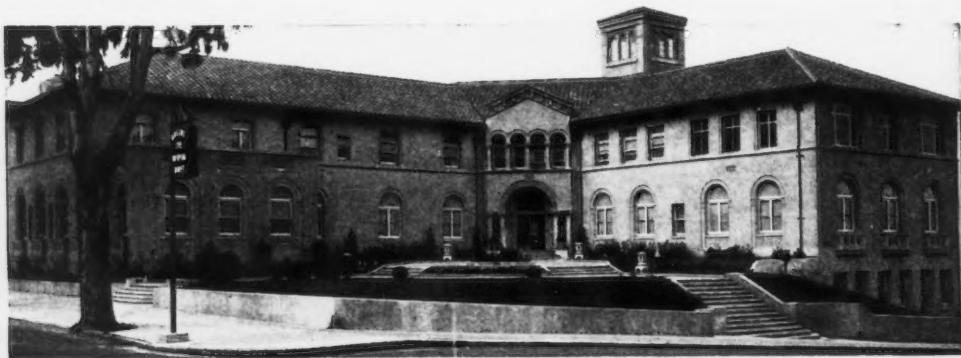
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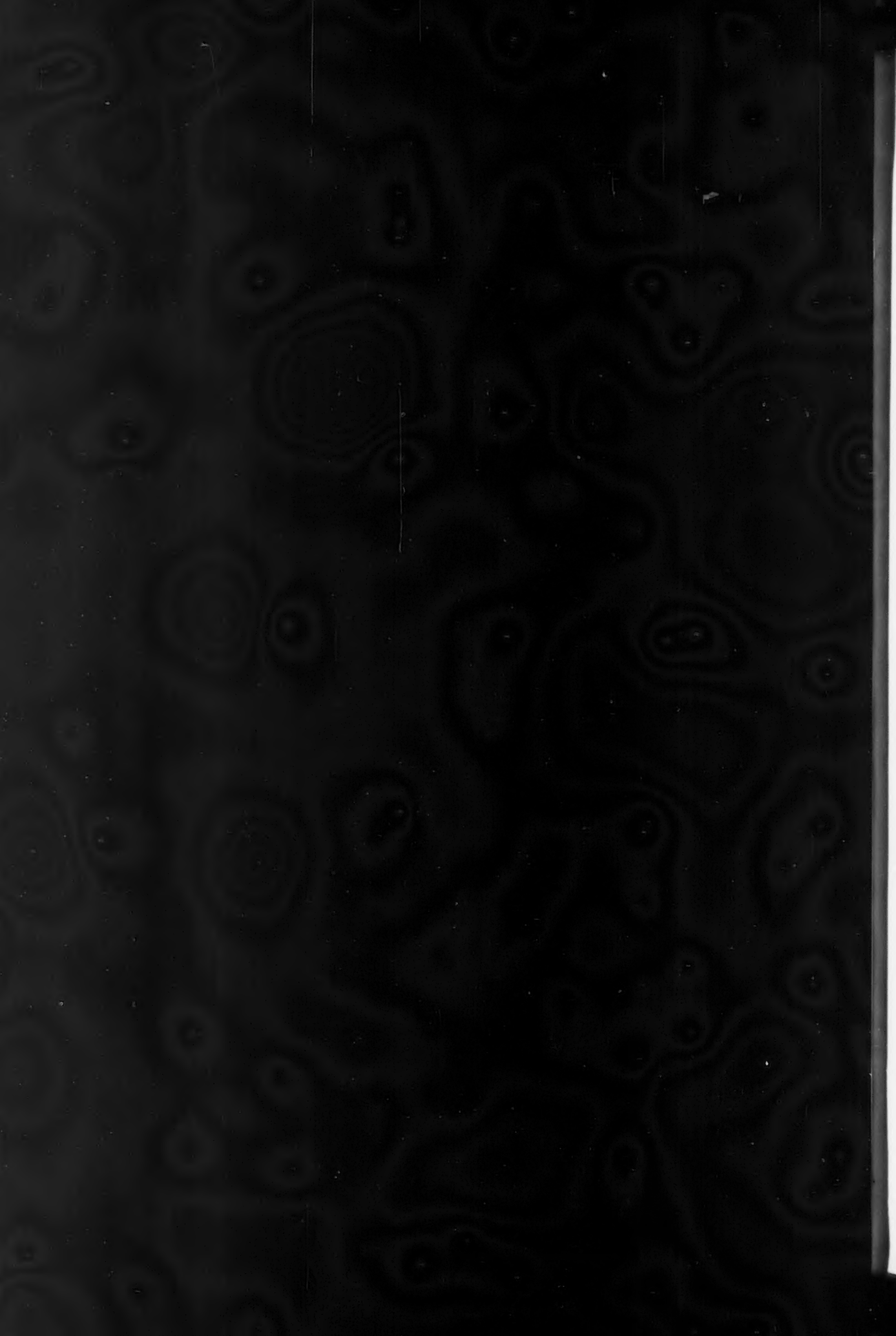
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No. 1

NON-ORGANIC CONVULSIVE DISORDERS OF CHILDHOOD—WITH SPECIAL REFERENCE TO IDIOPATHIC EPILEPSY*

By IRVINE MCQUARRIE, M. D.
Minneapolis, Minnesota

I

MEDICAL HISTORY affords no more interesting nor more tragic chapter than that concerning the convulsive disorders of children. This is particularly true of epilepsy, which, because of its chronicity and its intractability in the face of all efforts at treatment, has apparently puzzled and plagued mankind everywhere since the very dawn of the human race. Even in this enlightened day, most physicians, as well as laymen, rightly regard a severe generalized convulsion with alarm, and are filled with despair when the symptom recurs in chronic form. The basis for this attitude is to be found not only in the awareness that a convulsion may herald the onset of certain extremely serious diseases, but even more in the glaring deficiency of our knowledge regarding the causative mechanisms in those chronic convulsive states for which no structural pathology can be demonstrated.

A general survey of the convulsive disorders seen over a period of years in any large pediatric clinic of the temperate zone would probably show a distribution of cases on the basis of etiology and age not significantly different from that shown graphically in Figure 1. Here it may be observed that the relative frequency of certain etiologic factors varies greatly with age. Birth injuries and congenital defects of the brain account for a large majority of cases during the first month of life, acute infections playing a secondary rôle. During the next three months the order is reversed. Throughout the remainder of infancy, and in very early childhood, infantile or rachitic tetany assumes an important position. During the age

period immediately above this, the acute infectious diseases again play the major rôle, with idiopathic epilepsy also accounting for a significant percentage of cases for the first time. Throughout the remainder of childhood—that is, beyond the sixth year—the latter disorder is by far the most frequent cause of convulsive seizures.

Granting that a small percentage of the patients here classified as idiopathic epileptics might be found by careful encephalographic or postmortem studies to have structural lesions in or about the brain, it is generally conceded that the great majority show no such changes. This, then, brings into numerical prominence the entire class of convulsive disorders for which no definite brain pathology has been demonstrated. The present paper deals primarily with this type of disorder. (See shaded portion of charts in Figure 1.) The chief representatives of the non-organic convulsive group are the following: infantile and other forms of tetany, hypoglycemic states, uremia, acute poisoning with certain convulsant drugs, acute infections not directly affecting the brain or meninges, certain conditions involving impairment of the circulation to the brain, and finally, idiopathic, cryptogenic or genuine epilepsy. While the exact physiologic mechanism of the convulsions is not as yet known for any of these conditions, recognition of the fact that an organic lesion of the brain is not essential for the occurrence of either *petit mal* or generalized seizures, and that physiological or chemical disturbances can in themselves be the cause of seizures, is undoubtedly a first step toward a solution of the problem involved.

In spite of the fact that the primary etiologic factor is different in each of the above-named conditions, the generalized convulsion itself appears outwardly to be the same in all cases. From this we might expect certain features of the underlying physiological mechanism to be the same in all instances, and such actually appears, from the limited data available, to be the case. These common features, as well as certain differences, will be referred to later. Since time does not permit a detailed discussion of the mechanism and treatment

* From the Department of Pediatrics, University of Minnesota, Minneapolis, Minnesota.

* Guest-speaker paper. Read before the general meeting of the California Medical Association at the sixty-third annual session, Riverside, April 30 to May 3, 1934. This paper will be printed in two parts.

Causes of Convulsions at Different Age Periods

Stippled areas: functional. Unstippled areas: organic

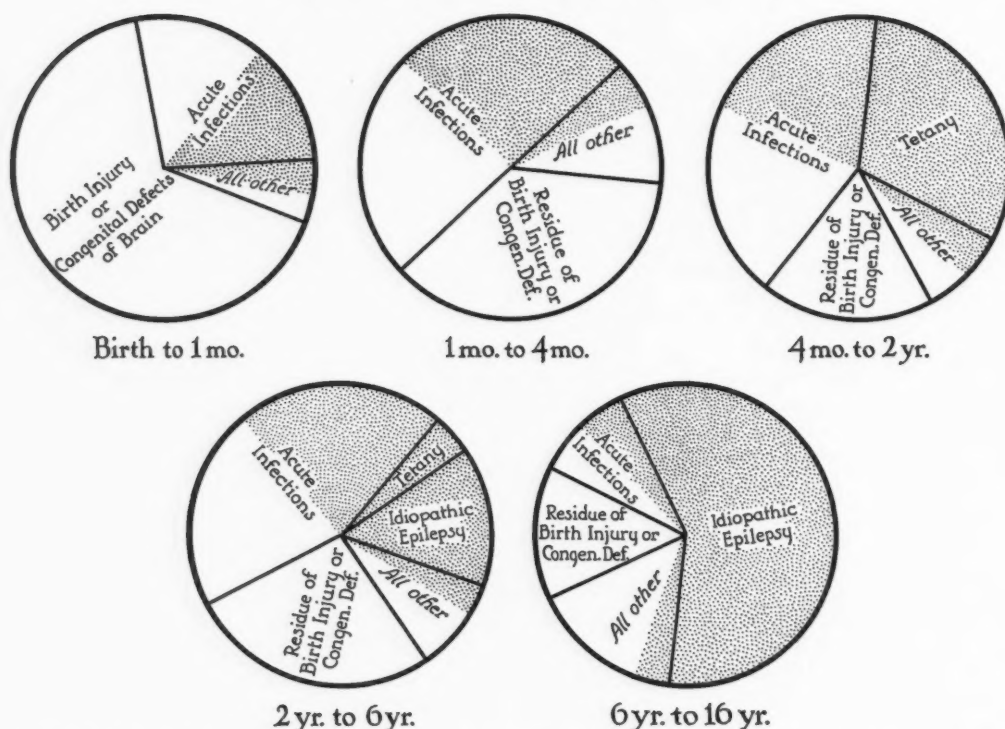


Fig. 1.—Schematic representation of the etiological distribution of patients admitted to the average pediatric clinic with the complaint of convulsive seizures.

of each entity under consideration, the results of recent studies on idiopathic epilepsy, the least well understood but most important representative of the group, will be presented.

In the way of definition, the admittedly unsatisfactory term "idiopathic epilepsy" will be employed to denote a particular type of convulsive disorder which is characterized by its chronicity and by the obscurity of its underlying etiology. The current fashion of using the term in a generic sense to group together all conditions in which convulsions occur is confusing and leaves the particular type of case under discussion inadequately defined. While it is true that the size of the group once classified under the diagnosis of idiopathic epilepsy has gradually been diminished with advances in our knowledge, the culling process has only increased our awareness of the fact that there still remains a large number of clinically similar cases, having in common an abnormal proneness to convulsive seizures for which no organic or physiological basis has as yet been demonstrated. In the following pages the two closely related aspects of the epilepsy problem, etiology and treatment, will be considered.

ETIOLOGY

The intrinsic nature of the subtle constitutional factor, which is responsible for the epileptic's characteristic proneness to seizures, constitutes the

unsolved etiologic problem of this convulsive state. No matter from what angle the problem is approached, one is invariably led to the same ultimate conclusion, that the chronic spasmophilic tendency is due to an inherent abnormality in the mode of functioning of the brain cells. There may well be some underlying defect in the chemical structure of these cells to account for their erratic behavior; but thus far, histochemical technique has not been sufficiently refined to detect this. Some indirect evidence referred to below indicates that the characteristic deficiency is one relating to the semipermeability of the brain cell membrane.

Whatever the nature of the abnormality may be, it appears to be firmly fixed in the germ plasm, and shows an unmistakable tendency to pass from generation to generation by inheritance, as shown by the recent report of Lennox and Cobb.¹ The inheritance factor appears from the work of these authors to be vastly more important in cases of epilepsy beginning in childhood than in those having their onset after the age of twenty years. Davenport and Weeks² regard it as a Mendelian recessive due to "absence of a protoplasmic element."

CONTRIBUTING ETIOLOGIC FACTORS.—In addition to the underlying abnormality just referred to as being responsible for the increased "con-

TABLE 1.—Average Values Per Hundred Grams of Various Foods Used in the Ketogenic Diet

Food Material (Edible Portion, Fresh State)	Fat Gm.	Protein Gm.	Carbo- hydrate Gm.	Calories	Water Gm.	Excess in Ash	
						Acid cc. 0.1 N	Alkali cc. 0.1 N
Forty per cent cream.....	40	2	3	388	54	....	25
Butter	85	....	....	790	15	....	....
Special French dressing.....	62	....	2	585	35	90	....
Special mayonnaise dressing.....	67	3	1	640	28	77	....
All food oils.....	100	....	....	930	....	....	....
Bacon—medium lean.....	65	10	....	645	20	65	....
Pork chops or fresh ham—medium fat	25	16	....	300	54	95	....
Beef, mutton or turkey—medium fat	20	18	....	260	60	110	....
Chicken, fish, wild game, tongue, veal—lean	5	19	....	125	72	125	....
Shell fish.....	1	16	3	87	80	90	....
Cheese—American, Cream, Swiss.....	33	28	1	420	30	....	6
Cottage cheese.....	1	21	4	115	72	....	40
Milk "substitute".....	20	4	1	204	74	....	50
Casein (Casec).....	1	88	....	366	....	....	....
Gelatin (dry or D'Zerta).....	....	84	....	340	14	....	....
Eggs, hens'.....	12	13	....	164	73	160	....
Egg white.....	....	12	....	49	86	52	....
Egg yolk.....	33	16	....	372	49	267	....
Brazil nuts.....	67	17	7	721	5	....	50
Butter nuts.....	61	28	4	698	4	....	50
English walnuts.....	64	18	12	718	3	....	65
Green olives.....	13	2	2	137	75	....	200
Avocado (alligator pear).....	23	2	7	243	66	....	75
"Five per cent" vegetables and fruits: (Lettuce, cucumbers, spinach, asparagus, beet greens, celery, mushrooms, watercress, cabbage, radishes, grapefruit, rhubarb, tomatoes) .....	....	1	3	16	92	....	65
"Ten per cent" vegetables and fruits: (String beans, squash, turnips, beets, cauliflower, onions, carrots, pumpkin, lemons, oranges, strawberries, muskmelon, peaches, pineapple, blackberries, watermelon).....	....	2	6	32	88	....	75
"Fifteen per cent" vegetables and fruits: (Green peas, parsnips, young lima beans, artichokes, raspberries, currants, apricots, pears, apples, blueberries, cherries).....	....	2	15	69	80	....	65
Yeast powder (Mead's).....	1	48	39	280	5	....	....

vulsive reactivity," there are numerous factors which may contribute to the occurrence of seizures, presumably by accentuating the abnormal tendency already present. Chief among these are brain trauma, emotional disturbances, any impairment of the intracranial circulation, anoxemia, shifting of the acid-base equilibrium toward the alkaline side, lowering of the ratio of cholesterol to lecithin in the blood plasma and, finally, a positive water-balance with dilution of the body fluids.

Injury to the Brain.—Injury to the brain and its coverings is undoubtedly a potent factor in bringing out the latent tendency to seizures. Re-

flex or direct irritation, whether mechanical, toxic or infectious in origin, tends to lower the convulsive threshold. Emotional upsets frequently have a similar effect, particularly in some cases of the *petit mal* type. The possibility has been suggested by Cannon that strong emotion, having its neural basis in the diencephalon, might cause discharges of impulses from the latter to the motor cortex.

Disturbances of Intracranial Circulation.—That disturbances of intracranial circulation may play a prominent part in the causation of seizures has long been suggested by the fact that the skin and

TABLE 3.—Correlation Between Changes in Plasma Lipids and Occurrence of Convulsions on Various Dietary Regimens

Successive Regimens (H ₂ O ad lib.)	Total Fatty Acids	Lecithin	Cholesterol	Lecithin Cholesterol	Convulsions
Ordinary Mixed Diet	210 220 259	102 103 99	83 80 79	1.25 1.28 1.25	Several daily
After 11 days on F., 149; C., 9; P., 36 g. (acid ash).....	270	125	113	1.10	None for seven days
Temporary high carbohydrate intake	340	141	95	1.49	Two hours before and one hour after sample
After 5 days on F., 149; C., 9; P., 36 g. (alkaline ash)	313	151	102	1.38	Sixteen during five days
After 6 days on F., 170; C., 0; P., 55 g. (ketogenic)....	383	175	208	0.84	None for five days before and three days after sample
After 3 days on F., 110; C., 0; P., 200 g. (non-ketogenic)	460	225	133	1.69	One hour before and one hour after sample

mucous membranes of some epileptic subjects are known to become pale just prior to the onset of a convulsion. During brain operations under local anesthesia, Kennedy, Penfield, Foerster and others have repeatedly observed blanching of the exposed brain at the onset of generalized convulsions; which suggests that reflex spasm of the cerebral arterioles might be an important factor in some instances. The objection to this being regarded as the primary cause is its inconstancy and the lack of proof that it is not itself an initial effect of the seizure, rather than its cause. Another obstacle in the way of accepting the circulatory theory of etiology for epilepsy is the recent finding of Cobb, Gibbs, and Lennox³ that the volume flow of blood through the brain in relationship to seizures is not abnormal, as determined by the use of a delicate thermo-electric blood-flow recorder. While severe asphyxia may cause convulsions, there is no outward evidence for the existence of this condition before the onset of a genuine epileptic seizure, and temporary mechanical pressure applied to the jugular veins is apparently no more likely to induce a convulsion in an epileptic than in a normal subject. While dysfunction of the *vegetative nervous system* might be expected to play an accessory part in the seizure mechanism of idiopathic epilepsy through interference with the circulation to the brain, the small group of patients described by Weiss and Baker⁴ as having convulsive reactions or fainting attacks due to hyperactivity of the carotid sinus reflex cannot be regarded as genuine epileptics, because seizures can be induced in the latter but rarely, if ever, by pressure over the sinus.

Endocrine Function.—That some abnormality of the closely related endocrine functions might contribute to the onset of epileptic attacks is naturally suggested by the fact that hyperinsulinism (or its equivalent, the underaction of the diabetogenic hormone of the hypophysis) and hypoparathyroidism, are both known to cause convulsive seizures in the absence of any pathological lesion in the brain. As will be shown under another heading, seizures can be induced almost at will in epileptic subjects by administration of antidiuretic

pituitary extract, if this is given under conditions favorable to the establishment of a strongly positive water-balance. Overdosage of epinephrin will also cause convulsions in normal animals. However, there is no convincing proof that any of the glands of internal secretion are characteristically abnormal in epilepsy.

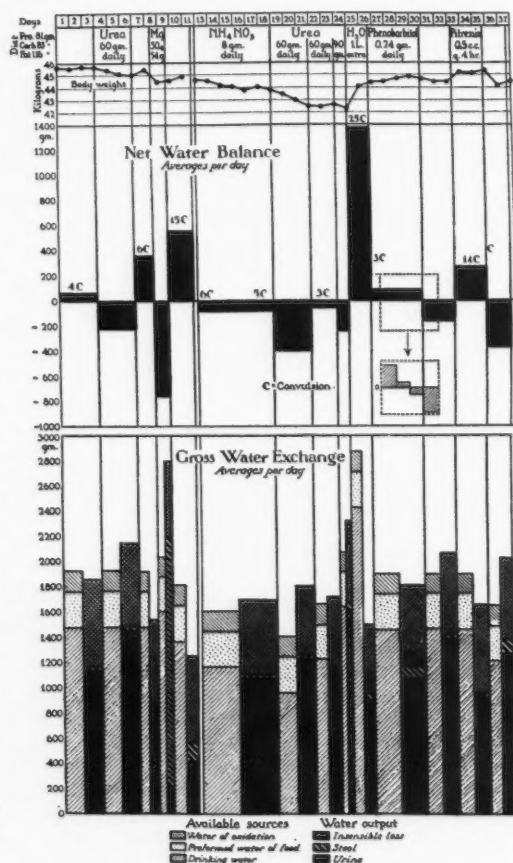


Fig. 2.—Relationship of water balance to occurrence of convulsions (C) under various conditions.

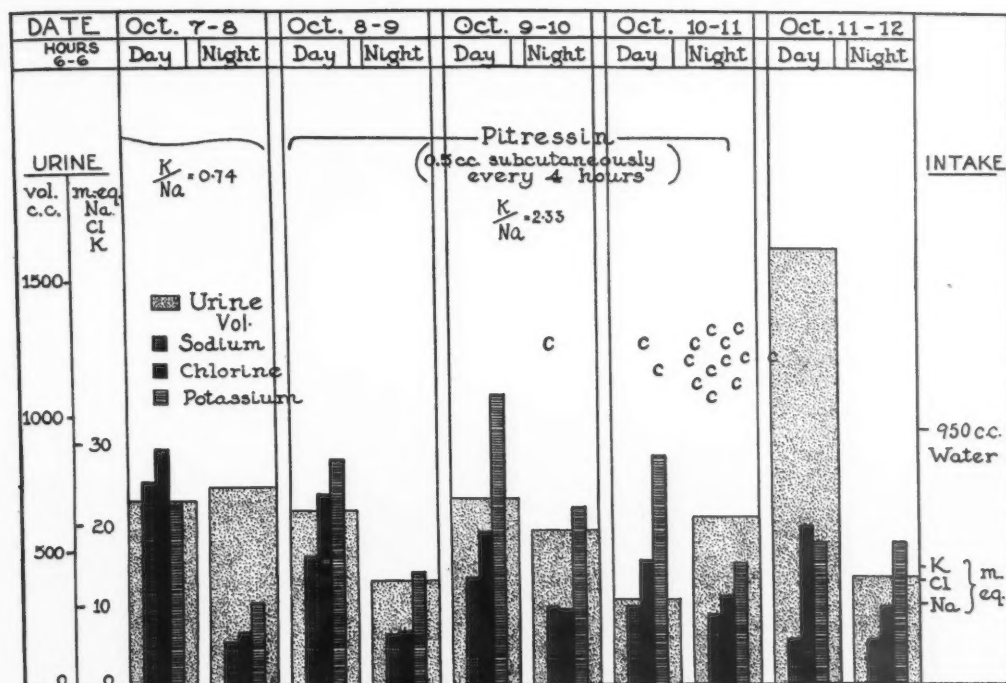


Fig. 3.—Water, Na, K and Cl balances in relationship to occurrence of convulsions (C) induced by sustained pituitary antidiuresis.

Anoxemia.—Anoxemia is thought to be the important abnormality responsible for the convulsions of cerebral anemia or asphyxia. Lennox⁵ has found that the ease with which seizures can be induced in epileptic patients by voluntary hyperventilation of the lungs is greatly increased if the subject is placed in an atmosphere with reduced oxygen tension. Oxygen tensions above those of the ordinary atmosphere lessen the tendency for seizures to follow hyperventilation, but do not appear to inhibit spontaneous seizures. Up to the present time, however, no characteristic abnormality of the respiratory functions has been discovered in epilepsy. Nevertheless, any serious interference with the supply of oxygen to the brain cells tends to favor the occurrence or seizures, unless this effect is simultaneously offset by an increase in the hydrogen ion concentration of the system, as it may be when air is rebreathed.

Acid-Base Equilibrium.—That the acid-base equilibrium of the body fluids might bear some relationship to the occurrence of convulsive seizures was suggested by the well-known fact that alkalosis increases, while acidosis decreases nervous irritability. Certain workers in Copenhagen, and later several in America, presented evidence of an unstable acid-base equilibrium in epileptic patients, which was most noticeable just prior to the onset of seizures. More dependable proof than that afforded by these observations, however, is the well-recognized fact that procedures which cause alkalosis (such as the administration of alkaline salts, hyperventilation of the lungs and prolonged

vomiting), tend to induce seizures; while those factors which cause acidosis (such as diarrhea, fasting, a ketogenic diet, ingestion of mineral acids or acid-forming salts and breathing an atmosphere high in CO₂) all favor the cessation of seizures. The convulsion itself is terminated by the development of the endogenous acidosis arising from retention of CO₂ and extra production of lactic acid from violent muscular contractions. Alkalosis not only increases nervous irritability, but may interfere with brain circulation by virtue of the fact that it causes contraction of the smaller arterioles.

Lipid Economy.—Recent studies on the lecithin, cholesterol and total fatty acids of the blood in relationship to seizures indicate that there may be some obscure abnormality in the lipid economy in epilepsy.⁶ While no constant relationship has been found to exist between the absolute level of any lipid fraction and the occurrence of seizures, the lecithin-cholesterol ratio shows a striking tendency to be higher at, or near the time of convulsions than at other times. (See Table 3.) This tendency for seizures to be related to high lecithin and low cholesterol concentrations may find a rational interpretation in the known effects of these two physiologically antagonistic substances, which occur in unusually high concentration in brain cells. Cholesterol, when injected intravenously, produces profound narcosis and active diuresis. Lecithin exhibits almost opposite effects, for, when it is administered parenterally in conjunction with a narcotic, it shortens the period of

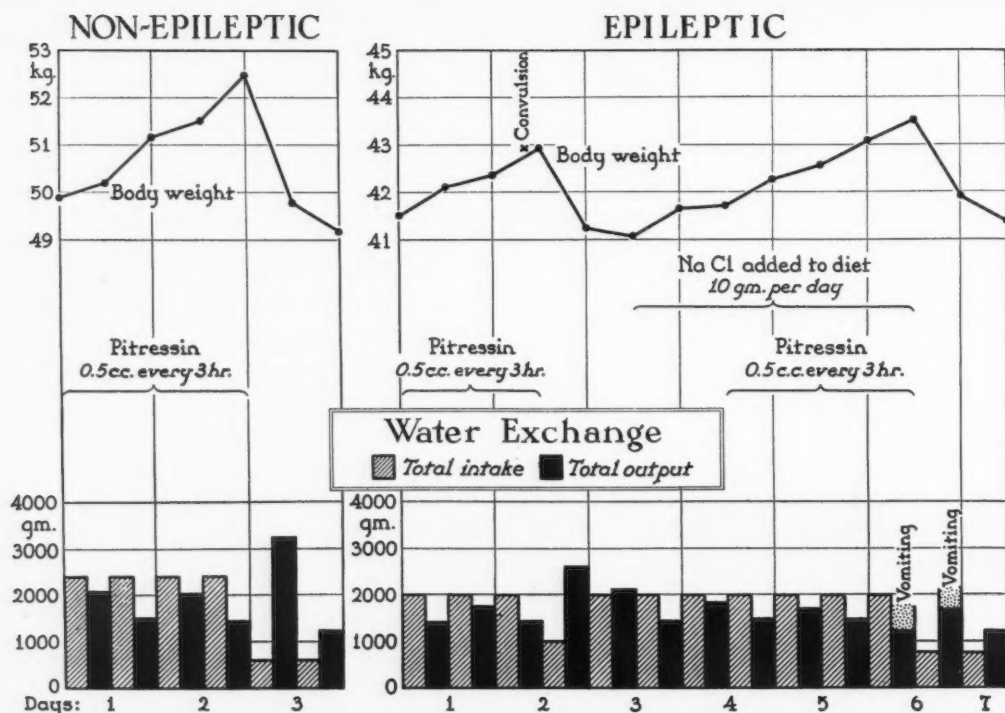


Fig. 4.—Effects of sustained pituitary antidiuresis in mild epilepsy with salt-free and with salt-containing diets. (See text.)

narcosis. When given with a convulsant drug, such as strychnin, lecithin diminishes the convulsive dose. It likewise tends to cause a retention of water in the body. Several of the current theories of narcosis and sedation take into account equilibria involving the various cell lipids, particularly in connection with the concept of cell membrane permeability. Comparative analyses of the brain tissue of epileptic and non-epileptic subjects of similar ages are being carried out in our laboratory with the hope that they may shed additional light on this phase of our problem. In this connection it may be significant that brain tissue normally contains more than twice the concentration of cholesterol during adult life that it contains during early childhood, the period when susceptibility to convulsions is highest. The concentration of lecithin, on the other hand, is almost as great in the brain of the young child as in that of the adult.

Water-Balance.—The significance of the water-balance in relationship to the occurrence of seizures in epilepsy has long been suspected from the fact that the brains of patients dying in *status epilepticus* show an increased water content. Even Hippocrates appreciated this relationship, for in his classical treatise on "The Sacred Disease" he states, "Whoever is acquainted with such a change (epilepsy) in men, and can render a man humid and dry, hot and cold by regimen, could also cure this disease." It has recently been found to be true that procedures which cause a negative water-balance in the body (such as restriction of the

water intake, diuresis, catharsis, profuse sweating, starvation, use of a ketogenic diet and administration of acid-forming salts) tend to prevent seizures. On the other hand, retention of water under certain conditions favors the occurrence of convulsions.

The mechanism of this relationship is not well understood. Fay,⁷ who first reported the clinical effects of water-restriction on cases showing encephalographic evidence of cortical atrophy, maintains that the effect of water retention is purely mechanical. This belief is based on his assumption that disease of the Pacchionian bodies is characteristic of epilepsy, and that fluid accumulates under increased pressure in the cortical subarachnoid spaces because its absorption by way of these structures is impaired. These claims have not been substantiated by other workers.^{8, 9, 10} The accompanying charts (Figures 2 and 3) show data from studies on the water and mineral balances in relationship to the occurrence of seizures, which permit of quite a different interpretation.¹¹

The purpose of the study reported in Figure 2 was to determine the effect of changes in water-balance upon the occurrence of convulsions when other factors than water restriction were employed to modify the water exchange. The experimental subject was a thirteen-year-old girl who was known to have from two to fifteen convulsions daily when not under intensive treatment. She was kept in the metabolism ward on a constant non-ketogenic diet. It is obvious, from the upper portion of the chart, that the essential factor

TABLE 4.—*Parallelism Between Effects of Various Factors on Permeability of Brain Cell Membranes and on Occurrence of Convulsions in Epilepsy*

Permeability		Physiological Factor	Convulsions	
Increased	Decreased		Induced	Prevented
....	X	Narcosis	....	X
....	X	Sedation	....	X
....	X	Acidosis	....	X
....	X	Dehydration	....	X
....	X	Ketosis	....	X
....	X	High bl. cholesterol bl. lecithin	....	X
X	....	Excitation	X	....
X	....	Trauma	X	....
X	....	Alkalosis	X	....
X ?	....	"Superhydration"	X	....
X	....	Anoxemia	X	....
X	....	Low bl. cholesterol bl. lecithin	X	....
X	....	Hypocalcemia	X	....
X ?	....	Hypoglycemia	X	....

in the reaction is the net, rather than the total, water exchange. While a strongly negative water-balance, produced in a variety of ways, resulted in a cessation of seizures, these always recurred within twelve to thirty hours following the re-establishment of a positive balance. Even those which occurred at the beginning, and toward the end of the NH_4NO_3 period, actually followed temporary water storage, which is not indicated in the chart.

A simultaneous study of the mineral exchanges showed that sodium and chlorine were in negative balance during all periods, showing a net loss of body water, but were stored during periods of positive water-balance. Potassium excretion, on the other hand, was greatly increased during periods of water storage, a negative balance appearing even before the onset of seizures. This is illustrated in Figure 3, which shows the K, Na, Cl and water-balances just before, during and after the pitressin period. Since most of the potassium of the body occurs within the cells, it is practically certain that a strongly negative balance of this element indicated leakage from the cells into the extracellular fluids from which it is excreted, chiefly by way of the kidneys. A non-epileptic subject did not show this phenomenon under identical conditions. From these and other data, yet to be presented, it may be assumed that sudden reestablishment of a positive water-balance, following a period of net loss, is accompanied in the epileptic subject by a severe disturbance of the electrolyte equilibria on the two sides of the brain cell membranes. The cells probably imbibe extra water under these conditions. The abnormal reaction is apparently accentuated by sustained pituitary anti-diuresis.

In a special study of the latter effect in mildly epileptic, as contrasted with non-epileptic subjects,

it was found that seizures could be induced almost at will in the majority of the former, but not at all in the latter by administration of posterior pituitary extract at three-hour intervals during periods of high water and low mineral intake.¹² That the seizures so induced were due to alterations in the water and electrolyte exchanges, rather than to the vasopressor action of the extract, was indicated by the fact that they occurred only after the amount of water forcibly retained became equal to between 2 and 5 per cent of the body weight. It has been shown that the extracellular body fluids undergo a considerable degree of dilution under these conditions. Prevention of this dilution by the simultaneous administration of just sufficient NaCl to bring the fluid retained to isotonic concentration interferes with the induction of seizures by this procedure, as illustrated in Figure 4. Prolonged dilution of the body fluids undoubtedly results in a disturbance of the electrolyte equilibria in a direction favorable to an increase in nervous irritability. The mechanism of the well-known therapeutic effect of bromids in epilepsy may ultimately find an explanation in the action of the Br ion in preventing dilution of the intracellular fluids of the brain. This is suggested by the recent demonstration by Notkin, Garcia and Killian,¹³ that administration of bromids causes an increase of from 15 to 36 per cent in the total halogen concentration in blood cells. Preliminary studies made in our laboratory indicate that there may be a similar storage of Br in brain tissue, following intensive bromid medication.

The apparent migration of potassium ions from the body cells (brain) of the epileptic prior to and during the course of seizures, and the observation that the epileptic cannot withstand dilution of his extracellular body fluids without having

seizures, have together been interpreted as indirect evidence of defective brain cell membranes. Confirmatory of this tentative view is the fact that the majority of factors which tend to induce seizures are alleged to increase cell membrane permeability, while those which tend to prevent their occurrence are known to decrease permeability. These factors and their effects are summarized in Table 4.

When one surveys the conceivable defects of the brain cells which might reasonably account for the abnormal convulsive reactivity of the epileptic patient, there is no other which appears to satisfy all of the requirements so well as that implied in the foregoing interpretation. As a working hypothesis, therefore, the generalization, that the epileptic differs from the normal subject in exhibiting an innate defect in his brain cell membranes, possesses some practical value in that all therapy may be directed toward correcting such defect or producing a decrease in permeability. It is obviously necessary to consider all of the foregoing etiologic factors in relationship to each other before accurate interpretation of a response to any single factor can be made. Under ordinary conditions there is present at any given time a multiplicity of contributing factors, some tending to provoke, others to prevent seizures. Whether or not a seizure will occur, then, depends upon the relative strength of the provocative as against the preventive forces.

From the meager data already available regarding the brain cell changes in the non-organic convulsive disorders other than cryptogenic epilepsy, it can merely be remarked that there apparently tends to be an increased water content in relationship to seizures in those types which have been studied. Drabkin¹⁴ has shown that the brain swells due to water imbibition before convulsions occur from insulin overdosage. Preliminary dehydration prevents such convulsions. Baar¹⁵ observed an increased water content in the brain tissue of subjects with infantile tetany, and considers this increased hydration to be of primary significance in the causation of convulsions in this condition. Ellis¹⁶ independently reported a similar increase in the water content of the brain in guanadine tetany and in experimental hypoparathyroid tetany. We have recently determined that a positive water-balance favors the occurrence of convulsions in a case of idiopathic parathyroid tetany. The "hard" edema (intracellular?) of the brain found in cases of acute nephritic uremia and in eclampsia of pregnancy, is probably of considerable importance in the convulsive mechanism in these disorders. Alkalosis tends to provoke convulsions in latent infantile or parathyroid tetany, while acidosis has the reverse effect. The effect of calcium deficiency in the body fluids in tetany may be responsible for a decrease in nerve cell membrane permeability; but, if this exists at all, it must be temporary, disappearing in response to antitetany therapy.

(To be continued)

HOW CAN PSYCHIATRY PROGRESS?*

By CLIFFORD W. MACK, M. D.
Livermore

THE honor of being chairman of this section carries a penalty, or rather an obligation, to present something at the meeting that furthers progress in our specialty. The chairman is allowed by custom to cover a wide range, rather than choose the limitation of a definite scientific subject. If, by taking advantage of this privilege, the remarks are discursive, it is for the purpose of pointing out some of the pressing needs confronting us.

THE NEUROPSYCHIATRIC SECTION

My responsibility would not be adequately fulfilled if I did not say something pertaining to the welfare, growth and development of this section of the California State Medical Society. We all have a duty that should not be left entirely to the officers who come and go each year, to make this section an important scientific body of the parent society. The importance of neuropsychiatry in the practice of medicine is well recognized and needs no defense. The men and women in the state engaged in this branch of medicine should take a greater personal interest in our meetings by attendance and participation in the discussions. The papers presented should only be the introduction that develops a free interchange of ideas. The members of the state and government hospital staffs are earnestly urged to take a more active part in the affairs of this section, as their presence at the meetings would add to the value of the scientific program, with benefit to themselves and their associates in the field of psychiatry. These members of the section have under their care in the state hospitals half of all the hospital patients in the state. The medical profession is more and more looking to psychiatry for assistance in clinical work. The public social agencies, and the various educators are calling upon psychiatry to lead in the solution of some of the problems of human behavior. In addition to all of this, there are a large number of patients going through the private offices of neuropsychiatrists as mild psychoses and psychoneuroses. The sum total of our endeavors is a vast part in the care of sick and handicapped people, and hence our section should be one of the most important in the society.

The section was organized on May 20, 1916. It is worthy of mention that the number engaged in our specialty in California, as judged by membership in the American Psychiatric Association, has increased from nineteen in 1913 to fifty-nine in 1933. The work of the section should proportionately increase so that it will be truly representative of the large field which it covers.

STATE HOSPITAL SERVICE

Mindful of my days in state hospital service, I cannot neglect the duty of calling your attention to the obligation we have toward those hundreds

* Chairman's address, Neuropsychiatry Section of the California Medical Association, at the sixty-third annual session, Riverside, April 30 to May 3, 1934.

of unfortunates in these institutions entrusted to our care. There are about 18,000 mental patients in the state hospitals whose woe or weal may depend upon the interest manifested in them by this section. We share responsibility with those directly in charge of them because this body of specialists can exert a powerful influence upon the state program. The state hospitals of California are among the best, from the standpoint of physical construction, administration and medical service, in the United States. They are directed by capable superintendents and staffed by medical men of high caliber. We should be vigilant to see that political interference does not disturb this situation. It is in our power to impress upon the state government the desirability of upholding conditions in the state hospital service, to the end that superintendents will have the authority to maintain the present high standards of psychiatric practice.

Fortunate we are, in California, to have a Department of Institutions headed by a physician rather than a non-medical man, and one who does not carry his burdens lightly. The hospitals under the direction of this department are progressive and efficient, and they are giving to their charges humane and benevolent care. There should be, however, in this state a psychiatric program that permits not only efficient handling of current problems, but one that incorporates research investigation into the cause and treatment of mental diseases. This cannot be fulfilled without complete separation of political and medical administration. We could well emulate other states, such as Massachusetts, with a permanent director in charge of the psychiatric system. This could be accomplished by a political board of six members to answer the needs of our system of state government. If the members of this board served a term of six years, two members retiring every two years, there would be continuity through changes of administration. The board could then appoint the director or commissioner, whose sole interest would be the hospitals under his jurisdiction. As a further step, the superintendents of institutions should be under Civil Service, and thus free from the danger of removal by changing political parties. It will be impossible to enlist good men to engage in state hospital service as a life's work unless some security and permanency can be given to them.

As chairman of this section, I would recommend that we have a committee on legislation whose object would be the accomplishment of these purposes. This committee could work with the Council of the State Society, or in an independent capacity if the Council agreed. The necessary legislation can only be accomplished through the weight and influence of organized medicine as expressed by the State Association.

THE ENLARGEMENT OF STATE HOSPITALS

A great need in the practice of psychiatry by the state is an enlargement of hospital facilities. I am informed that there is an overcrowding of almost 30 per cent in our hospitals at the present

time. This large, wealthy state should not allow its duty to the mentally ill to be neglected by false measures of economy. The proper treatment and care of sick people cannot be accomplished if the facilities are overtaxed to this extent. The new institution planned will only give temporary relief. A large building program, possibly a state bond issue, or money from the Federal Government, is urgently required at this time. The members of this section should exert their influence toward the accomplishment of this project through their individual efforts, and collectively through the legislative committee just mentioned.

STATE PSYCHOPATHIC HOSPITAL

The advancement of psychiatry in the state can be augmented by a state psychopathic hospital. The members of this section have advocated and sponsored such an institution for many years. It should be incorporated in any building program that is contemplated. We have examples of the benefits of the state psychopathic hospital in those states where they have been in operation for several years, so that little need be said in discussing its merits. The state psychopathic hospital would serve as a place for scientific exploration of psychiatric problems. The influence upon the medical work of the state institutions would be decidedly beneficial. The returns in years to come in the reduction of the total number of patients by preventive measures, the discovery of new methods of treatment, the saving in total amount of hospitalization, etc., would readily pay for the initial expense. The state psychopathic hospital in California should be located near the two medical schools, so that it would have the benefit of their various departments, and serve as a teaching center in psychiatry for students. The proper education of the doctor going into practice will do more to extend the benefits of psychiatry than any other measure.

COMMITMENT LAWS

There is a great need in California for a reformation in our commitment laws. Dr. Glenn Myers and other members of a self-constituted committee almost successfully waged this battle at the last state legislature. We cannot adequately practice psychiatry without proper legal machinery. We require not only a better mode of commitment to the state hospitals, but a means of controlling our private patients. A psychiatrist in practice needs the resources of a hospital for his patients, the same as a surgeon or medical man. What would surgery be able to accomplish if there were no hospital facilities to provide the surgeon and patient with those essential services? The psychiatrist in practice needs the therapeutic adjuncts that can be supplied only through an institution, but these are not available to the patient unless the patient can be legally placed there. The modifications in the commitment law, as proposed at the last legislature, contemplated the following things: temporary commitment for purposes of observation upon the affidavit of two physicians; discontinuance of arraignment; a hearing without the patient present; detention in a hospital, rather

than a jail; and transportation under care of hospital attendants.

I would add to these: Machinery for commitment of patients to private hospitals that are licensed and supervised by the State Department of Institutions. Every psychiatrist has experienced difficulties with certain borderline patients, whose standing in the community might speak against commitment to a state hospital or whose family would object. These patients are denied the benefits of hospitalization because of the legal obstacle that courts in California cannot commit to a private institution. The appalling number of suicides among prominent people might be diminished, if these patients could be sent to a place for proper care without going through the present cumbersome method of commitment, and then only to a public institution. The sponsorship of a new commitment law by this section could also be made effective by the Legislative Committee.

AFTER-CARE

There is need in the state and private practice of psychiatry for more attention to the after-care of patients. We have rather complacently accepted the belief that recovered or arrested psychoses are doomed to recurrences, particularly in the manic-depressive group. This conception can be seriously questioned. The labor and expense of carrying an acute case through the various phases of a mental illness can very easily be lost if our efforts cease at this point. Kraepelin long ago deduced from his wide statistics that only 50 per cent of manic-depressive patients had more than one attack.

I believe that in many instances recurrences happen because complete recovery is not attained before the patient resumes the regular activities of life. The best insurance against another attack is a genuine recovery, and a convalescence that keeps the patient out of the complexities of life until full restoration has been accomplished. The delicate machinery of the mind needs time and opportunity to readjust after an acute illness, the same as a decompensated heart needs adequate rest. The internist will keep a patient on a low expenditure of physical effort for many months after an acute illness, and we should follow the same principle with our mental patients. Allowing a patient to assume normal activity before proper stabilization, places a handicap that in a few months or years leads to another collapse.

The state agencies, although they now have social service departments, should provide more extensive after-care for the state hospital cases. This would undoubtedly prevent many recurrences and make possible a larger number of paroles, and thereby ease the burden upon the tax-supported institutions. In addition to the state patients, the neuropsychiatrist in his office practice could extend his activities to give more careful supervision of recovered cases. I have of late years placed special emphasis upon follow-up work, and find that families and patients both are very appreciative of the interest taken. The patient who is seen at monthly intervals is not only helped to a state

of better adjustment with problems, but may be spared another attack by the adoption of adequate measures when onset symptoms are presented.

MENTAL HYGIENE AND THERAPY

There is a need in psychiatry as a whole for an inventory of our armamentarium in the field of mental hygiene and therapy. Mental hygiene, so called, has concerned itself largely with surveys of psychiatric work being done throughout the country, with the application of the knowledge of psychiatry to social problems and with the betterment of care of patients in hospitals. There has been but little done in the field of individual mental hygiene or the development of a positive technique. If we are to fulfill our obligation as psychiatrists, we must formulate a constructive mental hygiene that will enable us to aid patients when they come to us feeling the disturbing influence of mental difficulties. The utterance of aphorisms, such as "Stop worrying," "You must pull yourself out of this," "It's up to you," etc., has often led to suicide, or the utter despair of the patient in the early stage of melancholia. We tell the patient that we understand the mechanism of the mental changes taking place, but as a matter of fact, do we? This positive assurance from a medical man may allay the fear, and can by suggestion create in the patient a feeling of faith and confidence; but if this does not occur, what other resources do we possess? The consideration of environmental influences may be enlightening, and the need of correction obvious to the patient as well as to the physician; but so often these cannot be changed. We have been preaching the importance of the early recognition of mental deviations, so that the public now expects definite results from our efforts. Some workers in the field of mental hygiene state that nothing tangible has been contributed, to date, in the sense of individual mental hygiene, and all that has been done is to point out that infancy and childhood represent the only period susceptible to modifying influences. Further, and as a corollary to this, parental education represents the only mode of attack. We cannot, however, take our adult patients back to that stage of life, and in most cases we cannot change the parental influence. We do not need to be unduly pessimistic, however, as it may be possible to treat this, as any other clinical problem, from the standpoint of the vital functions of the body and brain, and devise methods of altering the same. In addition to such measures, as the regulation of the patient's daily life by prescribed rest, proper occupational placement, the effort to acquire adequate emotional balance, study of the physical health, etc., means may be devised to formulate a constructive mental hygiene technique.

TREATMENT

The treatment of our mental patients leaves much to be desired. Aside from the application of rest, physiotherapy and occupational therapy to the functional cases, we do nothing except allow nature to take its course, hoping that we are dealing with a recoverable case. The diagnosis of a

malignant psychosis so many times condemns that patient to custodial care without any attempt at treatment. Psychiatry must justify its place in medicine in the years to come by more efficacious therapeutic methods. We have a stimulating example of what can be done when we review the history of the treatment of paresis. It was not many years ago that with the making of the diagnosis, sentence of death was passed upon the patient, as far as any effort on the part of the physician was concerned. What was formerly an incurable condition is now considered recoverable, by means of malaria, to the extent of 33 per cent. Why should we adopt a negativistic attitude to the so-called incurable forms of functional psychoses?

There is an urge at present to a greater use of psycho-analysis. This method is not suitable for many psychotic patients, and because of the time-consuming element cannot be applied at all where there are a large number under a physician's care. Psycho-analysis should by no means be considered the last and final resource. It only dissects, after all, and describes more minutely the mechanism of the symptoms after the mental disturbance has occurred. There is still back of all this a physiological alteration in brain functioning that causes the development of complexes, etc. We have not explored this field to its fullest extent. The study of the circulation in the brain, the mechanics of spinal fluid circulation, neuronic activity, the effect of certain medicinal agents upon mental functioning, should have serious consideration.

It is conceivable that in our functional psychoses some means can be devised whereby the brain activity can be decidedly altered. Why should an individual who has been functioning normally, develop a condition of mind that permits the assumption of control by the subconscious rather than the conscious? This can just as well be explained on the grounds of a physiological disturbance as a psychological one. Histological investigations have not contributed much up to date in this regard, and probably there are no structural changes other than molecular. If by means of some chemical or physical agency neuronic activity can be altered, there may be a restoration of that intangible thing which we call nervous energy. I am impressed, more and more, by the belief that many functional psychoses are exhaustion syndromes. There may be a storehouse some place for nervous energy, the depletion of which causes abnormal psychic manifestations. Physiological functions of the brain and nervous system are undoubtedly altered in all of our psychoses, even though structural changes are not revealed in the cellular elements. Is it not conceivable that the mental operations may be affected by some clinical measures? If we treat a heart disease, efforts are made to augment the action of the heart muscle. In like manner may we not influence brain function by a more direct mode of attack?

The purely psychological methods take into consideration the effect upon psychic structure of the exigencies of life and the modifying influences of certain experiences. These, after all, are not

so different in kind in individuals, and hence some deeper reason for the break-down of mental action must be discovered.

The writer has long cherished the hope that something of an accurate scientific nature would be discovered in regard to the character of neuronic activity in the brain. It is possible that this has been accomplished by Professor Berger⁶ of Jena. He has demonstrated that action currents exist in the brain, and that these differ during the stages of brain development. Also, that there are variations in individuals and in certain mental states. He further shows that there are constant electrical fluctuations associated with the activity of the cerebrum. These are absent in the newborn, and during the first few weeks of life. The curve of the fluctuations has a distinct form for each adult. They continue during sleep, but not in states of unconsciousness or anesthesia. The waves are greatly changed in mental diseases.

It is conceivable that clinical and laboratory investigation may yet reveal a means to influence the psychic functions of the brain. To illustrate my point by brief mention of some data already available: The brain uses exclusively carbohydrate as a source of energy even in the absence of insulin (Himwich and Nahum).¹ How often do we see improvement in certain psychoses only when there is a gain in weight? Blood calcium and phosphates (Henry)² increased in manic states and decreased in depressions. Caffein (Denker)³ lowers cerebrospinal fluid pressure 36 per cent after intravenous injections, with a return to normal in thirty-seven minutes. Histamin (Forbes, Wolff, Cobb)⁴ in animals produced dilatation of brain vessels and cerebrospinal fluid pressure rises. There are other drugs and chemicals, the effects of which have been long known, too numerous to mention, such as alcohol, adrenalin, pituitary extract, amyl nitrate, etc. These are the types of pharmacological investigation that we most need. The proper exhibition of some of these drugs may lead to a method of therapy that would assist in the restoration of normal physiological function.

It seems worth while to call attention to some forms of special or empirical treatment in dementia praecox that may have merit, such as production of aseptic meningitis (Carroll),⁵ the use of foreign protein, and the production of a leukocytosis by the use of Lundvall's solution or hemoprotein.

In conclusion, then, these are some of the needs of psychiatry, and I have tried to point out the roads along which we may progress. The development of a more energetic and positive therapeutic program for all types of patients will result in extension of our knowledge. If we only succeeded in discovering methods that would cure a small number of malignant psychoses, or materially lessen the duration of self-limited cases, there would be an enormous economic saving and great credit to psychiatry. We sometimes think that neuropsychiatry is being encroached upon by many of the other specialties, such as psychology, general medicine, syphilology, and neurosurgery. This should not cause us any alarm, but rather a feel-

ing of pride, and stimulate us to seek new truths to incorporate in the service we may render. The place of neuropsychiatry in medicine will not be jeopardized if we use intelligently all the resources at our command, and diligently seek new fields of usefulness.

Livermore Sanitarium.

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BAD ANESTHETIC RISKS—THEIR MANAGEMENT*

By JOHN MILLER WILSON, M. D.
Pasadena

WITH the proper selection of anesthetic agents, and their scientific administration, there should be little need for a paper dealing with bad anesthetic risks. There are very few patients who cannot take a properly selected anesthetic, carefully administered. This conclusion has been drawn after the review of some fourteen thousand anesthetics.

In the various types of bad anesthetic risks, their management depends on the selection of the proper anesthetic agent, and the choice of the different methods of administration suitable to the case, as well as on preliminary and postoperative treatment.

CARDIAC RISKS

Cardiac cases may or may not be bad risks. A simple heart murmur, without symptoms of decompensation, dyspnea, cough, edema or pain on exertion, with a normal electrocardiogram, should give no trouble under ordinary operative and anesthetic management.

Hypertension without symptoms, and which responds to treatment, should be disregarded. However, if hypertension is associated with substernal pain, or precordial distress, increased by exertion, nervous strain, or after a heavy meal, an electrocardiogram should be taken, and a guarded prognosis given in all operative procedures.

The blood pressure should be frequently checked during the operation, and the excitement stage prevented as much as possible by preliminary sedatives, and a quick induction. In prolonged operation a sudden drop in blood pressure calls

for increase in oxygen percentage, and atropin to prevent pulmonary edema.

Cases with an electrocardiogram showing abnormal changes in the R. T. interval, associated with precordial distress, or substernal pain, with or without nausea, and these symptoms intensified by effort, require extreme caution in anesthetic management. These are the signs and symptoms of coronary sclerosis and an attack of coronary occlusion, and sudden death may occur at any time. Not long ago the author was called to an adjoining operating room, where a colleague had such a patient who died suddenly, during a tonsillectomy, before the first tonsil was removed. The patient had previously complained of precordial distress and orthopnea.

Myocardial damaged cases with inverted, diphasic, or low amplitude T-waves, in either the first or second leads of the electrocardiogram, especially if associated with hypotension, and symptoms of decompensation, dyspnea on exertion, cough or edema require extreme caution. Preliminary treatment with rest, and digitalis, before the operation, if possible, is important. During the operation frequent blood pressure, pulse and respiration records should be taken, also supportive treatment given with caffeine, atropin, glucose subcutaneously, or blood transfusions in hemorrhage cases. Here I wish to register against large quantities of glucose, or normal salt solution, intravenously in heart cases; one in so doing may embarrass an already overworked heart. It is better to give these solutions subcutaneously, for then they will be absorbed slowly as needed.

Auricular fibrillation patients should, of course, be well digitalized, if time permits, before attempting any operation. Patients with any form of heart-block, as shown by the electrocardiogram, require special treatment: as with thyroid extract, if associated with low basal metabolism rate; caffeine in complete heart-block; and the nitrites or similar vasodilators, if associated with hypertension.

RESPIRATORY RISKS

Mechanical obstructions of the upper air passages by foreign bodies sometimes test one's ingenuity to the limit. In these cases, one should be prepared to give anesthesia under pressure, and sometimes it may be necessary to do a tracheotomy, below the site of the obstruction, if it is possible to do so. I recall a case many years ago where a child had swallowed a jack, which became lodged in the upper part of the esophagus. This was before the modern anesthetic machines were devised, and it was necessary to give ether by the drop method. The jack was located by means of the esophagoscope; but while the operator was attempting to remove it the instrument slipped off the jack at a critical moment and the trachea was completely closed. The child died from asphyxiation, even though a tracheotomy was done. At the present time gas under pressure, or by the endotracheal method, might have prevented this fatality.

In thoracoplasties, where collapse of the chest wall becomes necessary for the treatment of tuberculosis, lung cavities or abscesses, it is important

* Chairman's address, Anesthesiology Section of the California Medical Association, at the sixty-third annual session, Riverside, April 30 to May 3, 1934.

that a complete cardiac examination be made, including an electrocardiogram. This is essential because of the damage to the myocardium, which often occurs in these cases, following prolonged infection.

If the myocardium is seriously damaged, as shown by the inverted, diphasic, or low amplitude of the T-waves in the first or second leads of the electrocardiogram, rest and digitalis often improve this condition. By careful management of these cases during the operation, using as high a percentage of oxygen as possible to produce sufficient relaxation, shock may usually be prevented. It is important in these cases to watch the pulse, respiration and blood pressure very carefully. The blood pressure is usually raised about 10 millimeters of mercury, at the induction of the anesthesia, and this reading is generally maintained until evidence of shock appears, when the blood pressure begins to drop. This is the time to advise the operator to terminate the resection of the ribs and suture the wound. If everything has gone well, from two to four large sections of ribs may safely be removed at each stage.

In thoracoplasties, position on the table is very important. The patient should be placed on the well side, with the legs acutely flexed at the hips and knees, and secured by means of a strap below the knees, and an adhesive strip two and one-half inches wide and long enough to extend over the upper hip, being firmly fastened on either side of the table to prevent rolling of the patient. A large sand bag (14 x 8 x 4 inches) is placed against the chest, extending from the thigh to the axilla, so as to hold the chest firmly in a position—comfortable for the patient and convenient for the operator. It is very important for the patient to be comfortable, so as to interfere as little as possible with respiration. Have the patient cough and expectorate as much as possible before the anesthetic is started; this will give better respiratory excursion and a smoother induction.

The upper stage of thoracoplasties—the resection of the first, second and third ribs, especially in left-sided operations—is the stage which usually gives the greatest degree of shock. This is due to the fact that there is quite a maladjustment of the mediastinum, curving of the trachea, and displacement of the heart due to adhesions. When these upper ribs are resected, there is a sudden readjustment of the mediastinum, at which time I have seen the patient immediately go into shock, with rapid, feeble pulse, sudden drop in blood pressure, and sometimes the appearance of pulmonary edema. This condition requires quick action, with increase of oxygen percentage, atropin sulphate or caffeine—sodium benzoate per hypo, and rapid closure of the chest wall. In case of hemorrhage, which sometimes occurs at this stage, glucose subcutaneously and blood transfusions may be necessary.

RENAL RISKS

Nephritics do well under gas anesthesia. There should be no complications in any operation, on any part of the renal system, under gas anesthesia

properly administered. Nephrectomies, removal of calculi, cystoscopies and prostatectomies in most cases occur in middle age or elderly persons, and they all respond well to nitrous oxid or ethelene. These cases are sometimes complicated with cardiac conditions and should be so treated.

THYROID RISKS

Thyroidectomies should have preliminary treatment with sedatives, barbiturates, iodine, digitalis, and rest according to the basal metabolism rate, and amount of cardiac damage. These cases respond well to nitrous oxid anesthesia or local, as the individual operator prefers.

The possibility of mechanical obstruction of the upper respiratory tract, due to sudden collapse of the trachea, during certain types of goiter operations, must not be overlooked. We had one such case in Pasadena, during an operation for thyroidectomy, in which respiration was only maintained by oxygen under pressure, until tracheotomy was done to relieve a compression on the trachea. Anesthesia was then easily maintained through the tracheotomy tube, and the operation completed without further interruption. The patient made an uneventful recovery. Had we anticipated this condition, the difficulty could have been avoided by endotracheal anesthesia or by preliminary tracheotomy.

GASTRO-INTESTINAL RISKS

Gastro-intestinal surgery, carcinoma, perforated ulcer, intestinal obstructions, and gall-bladder surgery in most cases, require a small amount of ether in the gas anesthetic mixture, in order to get sufficient relaxation. In obstruction cases, it is good technique to routinely do gastric lavage before anesthesia. Fecal vomiting, or any form of vomiting, is not only annoying both to the anesthetist and operator, but also dangerous to the patient.

INJURIES

Head injuries, concussions, skull fractures with hemorrhage, usually require very little anesthesia and the treatment is for the most part that for shock.

ANEMIAS

Primary and secondary anemias require light anesthesia and high percentage of oxygen, and are not injured by gas anesthetics. Local or spinal anesthesia in these cases lowers resistance and may induce shock.

DIABETIC RISKS

Diabetic patients should be carefully checked for acidosis before operated, and blood sugar determinations obtained for their proper management. These cases should in no wise have ether, which increases acidosis. Gas with sufficient oxygen is the anesthetic par excellence in these cases.

The most thrilling experience we have had, as an anesthetist, occurred a few days ago, when Dr. E. B. Dewey and the author were called to the Woman's Hospital to see a six-day-old baby. Ever since birth, it was necessary to administer

oxygen to the infant almost continuously on account of dyspnea and cyanosis. The baby's heart was good, and a flat x-ray plate was taken of the chest and abdomen. The radiologist at the Pasadena Hospital, Dr. John Chapman, made a diagnosis of diaphragmatic hernia. He confirmed his diagnosis with a barium meal with x-ray showing all of the small intestines and most of the large intestine in the right chest, completely collapsing the right lung, partially compressing the left lung and crowding the heart over to the left. The child's condition was so desperate that after consultation, it was decided, in order to save the baby's life, it would be necessary to operate immediately.

After obtaining the parents' consent, the baby was taken to the operating room and placed on the operating table. Having been laid on the left side, the position necessary for the operation, it collapsed and was resuscitated by means of carbogen under pressure. The heart action continued good, and an operation being the only chance the baby had, the operator was advised to proceed.

Through artificial respiration inflating the left lung by means of the McKesson machine, using 95 per cent oxygen and 5 per cent carbon dioxide intermittently, about five or six times per minute, the baby was kept alive, but without respiratory movements. The first incision was effected through the right pleura, and an attempt made to replace the intestines. Since this was impossible, an abdominal incision was made, and with difficulty the intestine was pulled down into the abdominal cavity. The hernia being thus reduced, the opening, 6 centimeters in length in the diaphragm, was closed with four mattress sutures. After the hernia was closed, it was possible to inflate both lungs and the baby's condition improved. The operation lasted over an hour, and the only anesthetic used was 95 per cent oxygen and 5 per cent carbon dioxide until the last five minutes, when the skin sutures were being placed. The baby was limp and perfectly relaxed, life being maintained by periodically inflating the chest with carbogen. While applying the skin sutures, anesthesia was obtained by giving 50 per cent carbogen and 50 per cent nitrous oxide. At the close of the operation, breathing was regular, the normal pink color was restored, and the baby returned to the nursery in good condition. Six days later an x-ray showed the chest naturally expanded, and the intestines normally placed in the abdominal cavity.

CONCLUSIONS

1. In order to render the best possible service to the patient and the greatest assistance to the operator, in bad anesthetic risks it is necessary that a complete medical and surgical diagnosis be made prior to the operation.

2. The anesthetist must not only be trained in the mechanics of anesthesia, but must also be prepared to advise the surgeon as to the patient's condition at all times, and to anticipate complications in time to meet them.

605 Professional Building.

DIAGNOSIS VERSUS TREATMENT*

WITH REFERENCE TO DERMATOLOGY

By LOUIS F. X. WILHELM, M. D.
Los Angeles

IN all branches of medicine we are confronted with the importance of diagnosis as contrasted with method of treatment. It is true that the patient consults the doctor, as my former chief, Dr. Fordyce, often said, not to be handed a long Latin name which he cannot understand, but for relief of his complaint. In order that the physician may be able to give relief by intelligent treatment, he must not only be a good therapist, but a competent diagnostician. This is as true in the realm of skin diseases and syphilis as in any other field of medicine. We, who limit our endeavor to the diagnosis and treatment of skin diseases and syphilis, believe that a great many practitioners, without any attempt at diagnosis, divide skin lesions into two classes—those to which they apply calamin lotion, and those to which they apply zinc oxide ointment. And yet they claim to be physicians.

The difference between a regular physician and the cultist is in the scientific approach of the former, by reason of his knowledge of the fundamental sciences and his training in making a diagnosis. The physician who, without attempting to make a diagnosis other than skin-rash or eczema, prescribes calamin lotion or zinc oxide ointment, becomes a cultist in practice if not in name. He brings discredit upon himself, and adds to the ever-growing lack of confidence of the masses in the noble profession of the healing art. His action often serves to turn the patient from the regular physician to the cultist. Is it any wonder that the various cults thrive?

INCORRECT DIAGNOSIS

It is not uncommon in these days for the general practitioner to suspect allergy in every type of generalized itching dermatosis. So-called allergy is considered the basis of every itching-skin eruption. The morphology of the individual lesion, and the distribution of the various lesions and their possible relationship to some systemic disturbance, is entirely disregarded. It is quite the rule, then, to refer the patient who complains of itching to the allergist who, of course, is not in position to give a competent opinion. After his numerous scratch and intradermal tests prove to be negative or positive, he is at sea as to further procedure in reaching a proper diagnosis. Hopkins recently again has pointed out the importance of physical disturbance, rather than food or protein allergy in chronic urticaria. Clinical interpretation often is more valuable than laboratory methods, especially skin tests, in a great many generalized itching dermatoses.

Moses Scholtz recently called attention to a patient who was studied for weeks, with all kinds of scratch tests and intradermal tests, when a

*Chairman's address, Dermatology and Syphilology Section of the California Medical Association, at the sixty-third annual session, Riverside, April 30 to May 3, 1934.

diligent search for the burrow in the usual sites disclosed a typical scabies. Only a few days of antiscabetic treatment were necessary to give this patient complete relief, proving that skin tests were unnecessary.

Every dermatologist is familiar with the patient who is referred on account of a generalized eruption which has been treated vigorously for ringworm of the body by tincture of iodine, mercuriochrome, mycosal, kerolysin, and a million and one other proprietaries, but which was in reality a typical pityriasis rosea. Also, there is the patient with early mycosis fungoides or leukemia cutis, treated for scabies, and the patient with parapsoriasis and pityriasis rubra pilaris who was referred to the dermatologist after he had submitted to the countless scratch and intradermal tests of our modern allergist.

More serious still is unrecognized syphilis. Recently I saw a man with typical syphilitic papules scattered generally over the body, and involving the face, palms and soles, who had been allowed to marry because two Wassermann tests on the blood were negative. Certainly, we all know that secondary syphilis gives 100 per cent positive Wassermann reactions on the blood. Suspecting that alcohol might account for the negative test, it was found, on questioning, that for years the patient never consumed less than a quart of bourbon whiskey per day. After three days of total abstinence, the Wassermann reaction proved the strongest total inhibition of hemolysis that the laboratory had recorded in ten years. The wife, incidentally, also presented a typical roseolar secondary lues.

A physician's nurse or secretary often is quite difficult to handle. Some years ago I saw a nurse with a very suspicious appearing ulcer on the breast and a typical satellite lymph node of Fournier, and advised a Wassermann test of the blood. Three or four weeks later she returned for further advice. In the meantime, she had consulted a surgeon who made a clinical diagnosis of Paget's disease and referred her to an exclusive x-ray clinic for treatment. When two deep x-ray treatments had failed to influence the lesion, she again requested my opinion before proceeding to surgery. After an extreme amount of persuasion, the patient finally submitted to a blood examination which disclosed a total inhibition of hemolysis. Adequate treatment for syphilis restored a normal breast and averted an unnecessary mutilating operation. A number of years ago I saw a patient who presented an ulcer of the right tonsil with the typical satellite lymph node of Fournier. He had been told that the lesion was a sarcoma. Repeated smears examined by the darkfield method disclosed typical *Spirochaeta pallida*. Examination of the blood gave a strongly positive Wassermann reaction. Adequate treatment for syphilis was followed by complete recovery.

Numbers of examples of undiagnosed late syphilis could be cited. For instance, a patient presented himself for relief of attacks of periodic vomiting, after having submitted to five exploratory laparotomies without improvement. The appendix and gall-bladder had been removed, and

practically every abdominal organ had been studied macroscopically. Although blood Wassermann and spinal fluid examinations were entirely normal, a neurological examination disclosed typical findings of tabes dorsalis with gastric crisis. Thus, the five previous operations were proved to have been absolutely unnecessary.

I shall never forget the patient who was brought two thousand miles on a stretcher for medical aid, contrary to the advice of her family physician. She was found to have an infiltrating mediastinitis and pleuritis. Over a period of years, gradually she had become bedridden. Both her blood Wassermann and spinal fluid Wassermann reactions were strongly positive. Four months of active treatment for syphilis restored her powers of locomotion and caused an involution of all objective chest findings. This allowed her to return home and to walk unaided into her family physician's office, instead of being carried in as on her previous visit four months earlier. According to her own story, she asked him, "Why did you not test my blood and save me this 2000-mile journey?" A fair question, one must admit.

IMPORTANCE OF CORRECT DIAGNOSIS

These few case references serve to emphasize the importance of correct diagnosis before treatment is instituted. They could be multiplied easily. Failure to give the patient intelligent advice and proper treatment was due to improper diagnosis. The physician who makes a correct diagnosis can give a reasonably accurate prognosis. He will not subject the patient to irrelevant skin tests, to unnecessary treatment with various glandular substances, to contraindicated x-ray therapy, or to uncalled for surgery. At times one is inclined to think that patients so mismanaged might have done as well in the hands of cultists!

It is important in these days of various cults and isms that we, as a profession, examine our own practices. Possibly some of the material success of the irregulars is due to the failure of graduates from the recognized schools of medicine to admit their limitations. If a physician is unable to make a positive diagnosis, the patient invariably will welcome the suggestion of having consultation. Unfortunately there are still a great number of our profession who prefer to treat the patient without knowing what they are treating. In this way, they do exactly as the cultist who is always ready to try his adjustments or colonic washings or inane diet. To practice scientific medicine, we must know what the condition is before we suggest or begin therapy.

Pusey emphasizes the importance of diagnosis in a recent editorial in the *Archives of Dermatology and Syphilology* on "Treatment by Method Rather Than Diagnosis." He says:

"There is no satisfactory way of treating cutaneous or other diseases without knowing what one is treating. It is not sufficient to be expert in radiology, serum therapy, balneotherapy, electrotherapy, heliotherapy or surgical technique, or in any other method of treatment. None of them is a panacea. One needs to know what one is treating. In diseases of the skin it is not even suffi-

cient to take a piece of tissue and submit it to a pathologist; in most cutaneous diseases the clinical diagnosis is needed also, and the clinical diagnosis is always important. That is where the radiotherapists fall down in the therapy of diseases of the skin; they do not know and cannot find out what they are treating, and they proceed blindly. Even if we agreed to the proposition that the radiotherapists should treat the malignant growths of the skin, and the dermatologists should treat the non-malignant ones, the radiotherapists would still need the dermatologist to tell them which was which. One cannot diagnose one kind of diseases of skin—malignant ones, for example—unless one knows the other kinds."

While Pusey emphasizes the fallacy of radiotherapy without correct diagnosis, what he says is equally true of all other methods of therapy when the physician does not know what he is treating.

1401 South Hope Street.

RUPTURED ECTOPIC PREGNANCY*

By LEON J. TIBER, M. D.
Los Angeles

DISCUSSION by Edward N. Ewer, M. D., Oakland; James C. Doyle, M. D., Los Angeles; R. Glenn Craig, M. D., San Francisco.

THE material on which this paper is based consists of 248 cases of ruptured ectopic pregnancies treated in the Obstetrical Service of the Los Angeles County General Hospital from June, 1927, to December, 1932. These patients were operated on by the attending men of that service, and so the technique of the operations varies to a certain degree. However, definite rules and regulations laid down by the chiefs of that staff were observed in all cases.

As is well known, there has been nothing new found either in the symptomatology or the treatment of ectopic gestation in recent years except autohemofusion, which was used in 123 cases in this series. However, it may be of value to enumerate the symptoms and signs as found in this series of cases.

On reviewing the 248 cases, it was found that there was no uniformity of symptoms or signs, and Kelly's² dictum that the most typical thing about ectopic gestation is that it is atypical, is certainly borne out.

Whenever a woman in the childbearing period suffering from acute abdominal pain with uterine

* Read before the Obstetrics and Gynecology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

TABLE 1.—Age	
Years	Percentage of Cases
.... - 20	3.4
20 - 25	22.3
25 - 30	27.3
30 - 40	41.2
40 - +	2.9
Not given	2.3

TABLE 2.—Para and Gravida			
Para	Percentage of Cases	Gravida	Percentage of Cases
0	23.9	1	17.2
1	25.5	2	17.8
2	18.3	3	17.8
3	11.7	4	12.2
4	6.1	5	12.2
5 - +	7.2	6	6.8
Not given	6.7	7 - +	8.9
			6.7

hemorrhage is examined, one must consider the possibility of an ectopic pregnancy. In this series some of the cases were mistakenly diagnosed as acute appendicitis, uterine fibroid, dysmenorrhea, abortion, pyosalpinx, ovarian cyst, menorrhagia, and acute upper abdominal conditions.

TABLE 3.—Abortions and Miscarriages			
Abortions	Percentage of Cases	Miscarriages	Percentage of Cases
1	8.2	1	8.9
2	6.2	2	6.8
3	0.06	3	0.05
4 - +	0.06	4 - +	0.02

While there was no unanimity of symptoms and signs, still the following were found in most of the cases: some irregularity of menstruation, pains in the pelvis (with or without attacks of fainting), spotting or uterine hemorrhage of varying degrees, enlargement of the uterus (with or without a tender mass to any side of it), pain

TABLE 4.—Types of Menstrual Disorders		
	Number of Cases	Percentage
No missed periods.....	85	34.2
Missed period.....	118	47.6
Missed two periods.....	40	16.1
Missed three periods.....	5	2.0

on moving of the cervix, pain on defecation, pain referred to the subscapular region, and distention of the pouch of Douglas, with signs of internal hemorrhage and shock. In this series the most frequent differentials to make were abortions, incomplete or complete, tubo-ovarian disease, salpingitis, ovarian cysts, and uterine fibroids.

TABLE 5.—Pain in Ectopic Pregnancies		
	Number of Cases	Percentage
Sudden sharp pain with fainting	75	30.2
Sudden sharp pain without fainting	120	48.4
Sudden sharp pain after colicky pain	61	24.6
Colicky pain only.....	50	20.2
Shoulder pain.....	77	31.0
Shoulder pain not mentioned.....	177	71.4
No pain.....	4	1.6

TABLE 6.—*Abnormalities*

	Number of Cases	Percentage
Nausea	129	52.0
Vomiting	84	33.8
Abnormal periods	210	84.6
Spotting	72	29.0
Intermittent bleeding ..	92	37.0
Profuse bleeding	33	13.3

In sixty-nine cases where there was mistaken diagnosis, and in those patients where operation proved the disease to be salpingitis, the histories showed a preponderance of the following symptoms: high temperature with leukocytosis above 18,000, hazy history of infection and leukorrhea, a definite mass on one side of the uterus, with a

TABLE 7.—*Admission Temperature*

Temperature	Number of Cases	Percentage
97 or under 97	18	7.3
97.2 - 98.6	76	30.6
98.8 - 100	93	37.1
100.2 - 101	28	11.3
101.2 - 102	4	1.6
102 or over 102	3	1.2
Not given	26	10.1

suggestion of mass on the other side. It is surprising how few smear reports were found, especially when a positive smear might have been the deciding factor in the diagnosis.

Those cases proven ovarian cysts at operation gave a history of pain with faintness, irregular bleeding, and a fluctuating mass to one side of

TABLE 8.—*Admission Pulse*

Pulse	Number of Cases	Percentage
Unable to get	3	1.2
50 - 70	6	2.4
70 - 80	15	6.0
80 - 90	45	18.1
90 - 100	30	12.0
100 - 110	45	18.1
110 - 115	17	6.9
115 and over 115	40	16.1
Not given	47	17.9

the uterus. In those cases where the diagnosis of uterine fibroids was proven, there was a history of irregular menses, marked pain, and enlarged irregular uterus. Numerous times the patients denied the possibility of pregnancy, or else were not able to give a definite date of the last normal menses. From a review of these mistaken as well

as correctly diagnosed cases, one must conclude that a careful history is still the best means of arriving at a correct diagnosis.

Various methods⁷ have been suggested to establish the diagnosis. Vaginal puncture and aspiration of blood establishes the diagnosis after intraperitoneal rupture. Some advise routine diagnostic curettage, but it does not seem advisable, as it may destroy an existing intra-uterine pregnancy, and the microscopic findings are not always conclusive. Repeated blood studies have been advised, but the method seems to be far too procrastinating. The Aschheim-Zondek test is a new method of great value in the diagnosis of early pregnancy, and was used in some of the more recent cases of this series.

Had the puncture of the posterior cul-de-sac with a needle, to verify the presence or absence of free blood in the pelvic cavity, been practiced more often, many of the mistaken diagnoses could have been corrected. If done with the proper technique there is little or no danger of infection; and the puncture can be done without an anesthetic.

In 1914 F. Thies⁸ of Leipzig first utilized the free intra-abdominal blood for infusion purposes in cases of ruptured ectopic gestation, and since then the method has found much favor in Europe. Appleby⁴ of Canada reported nine cases of autohemofusion in ruptured ectopic gestation. Maynard and Reiss⁵ of Vermont report one case. The latest American reference is by Ricci and Di Palma.⁶ They report twelve cases of autohemofusion in ectopic pregnancy, and also review the literature and technique of procedure in their paper. They advise the use of the name "autohemofusion" in preference to autotransfusion.

The question of autohemofusion in ruptured ectopic gestation is of importance. It is not always easy to find a donor among the patient's relatives, where the patients are not financially able to get a donor of a known grouping. When a donor from among the relatives is found, much time is necessary for the proper blood studies, and time is a very important factor in a case of active bleeding. In autohemofusion a great deal of valuable time is saved. It allows the doctor to operate as soon as a diagnosis is made. It is a fairly simple procedure, especially as it is practiced at the Los Angeles County General Hospital. The patient is prepared in the usual manner. She is kept in a horizontal position, so that the free blood may gravitate to the pelvic cavity and thus facilitate its removal. When the peritoneum is exposed, a small incision is made, suction apparatus is inserted into the peritoneal cavity, and the blood sucked up into a receptacle. The blood is then

TABLE 9.—*Comparisons of Mortality Rates*

	Number of Cases	Deaths	Percentage
Autohemofusion only	123	1	.81
Direct transfusion and autohemofusion	66	2	3.03
Direct transfusion only	29	2	5.09
No transfusion	86	2	2.3
Total number of cases	248	7	2.8

TABLE 10.—*Blood Picture*

LEUKOCYTIC COUNT		Highest count: 48,000				Lowest count: 4,250		
Count in thousands		— 6	6 — 8	8 — 10	10 — 16	16 — 24	24 — +	Not given
Number of cases		2	24	27	71	66	24	34
Percentage .....		.7	9.7	10.9	28.6	26.6	9.7	13.7
RED CELL COUNT		Highest count: 6,020,000				Lowest count: 1,100,000		
Count in millions		1	2	3	4	5 — +		Not given
Number of cases		11	53	107	31	7		37
Percentage		4.4	21.4	43.0	12.5	2.7		14.9
BLOOD PRESSURE								
Systolic		40 — 50	50 — 75	75 — 100	100 — 125	125 — 150	150 — 175+	Not given
Number of cases		2	20	46	84	52	5	39
Percentage .....		.7	8.1	18.5	33.8	21.0	2.0	15.7
Diastolic		10 — 20	20 — 40	40 — 50	50 — 75	75 — 85	85 — 125+	Not given
Number of cases		2	15	22	95	56	19	39
Percentage .....		.7	6.0	8.9	38.3	22.6	7.7	15.7

filtered through ten layers of citrate saturated gauze into a graduated container, the necessary amount of 2.5 per cent of sodium citrate solution is added and this mixture is immediately reinjected into the patient's vein with a 50 cubic centimeter syringe. The usual precautions of an ordinary

ectopic pregnancy is made, be it ruptured or unruptured, operation is indicated, and the result in this series of cases justifies that procedure. Thus we find that in the cases that were operated on the same day after admission, there were no deaths, and the deaths that occurred were in cases where they were operated on the third, sixth, tenth, or fourteenth day. As the cause of death in three cases was blood dyscrasia, it is of interest to note that in all these cases the operation was later than the third day. Is it reasonable to assume, then, that some change has taken place in the free blood in the peritoneal cavity that caused the dyscrasia after that same blood was reinjected into the patient's circulation? In the cases operated on the same day in which autohemofusion was done, no deaths were claimed to be due to blood dyscrasia. In the recent paper by Ricci and Di Palma⁶ it was shown that the red cell count of the intra-abdominal free blood was microscopically normal as late as seventy-two hours after the time of the rupture.

There were seven deaths in this series: one in the cases of autohemofusion, two in the cases of autohemofusion and direct transfusion combined, two in the no-transfusion cases, and one in the direct transfusion only. Thus we see that in this series the lowest mortality is in the autohemofusion cases. However, in reviewing the causes of death in these cases, it is seen that in the autohemofusion death the cause was blood dyscrasia.

TABLE 11.—*Time of Operation After Admission*

	Number of Cases	Deaths	Percentage
Operated same day..	145	—	.....
Second day	35	—	.....
Third day	12	2	16.7
Fourth day	22	—	.....
Fifth day	4	—	.....
Sixth day	6	2	33.3
Seventh day	6	—	.....
Eighth day	2	—	.....
Ninth day	3	—	.....
Tenth day	3	1	33.3
Twelfth day	3	—	.....
Thirteenth day	3	—	.....
Fourteenth day	3	2	66.6
Fifteenth day	1	—	.....

transfusion are observed, and no unusual complications are encountered.

In this series most of the cases were operated on the same day that the patient was admitted to the hospital, as soon as the diagnosis was made. The only reason for any delay in operation was the uncertainty of the diagnosis. The chiefs of this service hold that as soon as a diagnosis of

TABLE 12.—*Cause of Death*

Cause of Death	Cause of Death	
	Auto-hemofusion	Direct Transfusion
1. Exsanguination and shock because of blood dyscrasia following operation for ectopic pregnancy	+	—
2. Exsanguination and shock because of blood dyscrasia following operation for ectopic pregnancy	+	+
3. Ruptured ectopic and hemorrhage into peritoneal cavity.....	—	+
4. Ruptured ectopic and diabetes mellitus.....	—	+
5. Ruptured ectopic and pulmonary embolus with terminal pneumonia.....	—	+
6. Ruptured ectopic and paralytic ileus with intestinal obstruction.....	+	+
7. Possible embolus to lung or brain.....	—	—

In the two cases where autohemofusion and direct transfusion were used, one died of paralytic ileus and intestinal obstruction, the other of exsanguination and shock caused by blood dyscrasia. In the cases where direct transfusion only was used, the cause of death was hemorrhage into the peritoneal cavity, possibly due to an error in technique; the other death being due to pulmonary embolus and terminal pneumonia. Surprising as it may seem, in the cases where no transfusion was done, one death was due to embolus, and the other was ascribed to ruptured ectopic pregnancy and diabetes mellitus.

Thus we see that the mortality rate in 123 cases where autohemofusion was used was .81 per cent; in sixty-six cases where direct and autohemofusion combined were used, the mortality rate was 3.03 per cent; in thirty-nine cases where direct transfusion only was used, the mortality rate was 5.09 per cent; and in the eighty-six cases where no transfusion was used, the mortality was 2.3 per cent. The combined mortality rate in this series was 2.8 per cent, a figure which compares very favorably with the mortality rates noted by other observers. Considering that many of the patients who are sent to the County Hospital are badly neglected ones, the staff is to be congratulated on the results obtained.

CONCLUSIONS

1. A study of 248 cases of ectopic gestation showed a mortality rate of 2.8 per cent.
2. In the 123 cases of ruptured ectopic gestation that have been autohemofused the mortality rate was .81 per cent.
3. Autohemofusion is a simple procedure, and with ordinary precautions is devoid of risk.
4. No elaborate equipment is necessary for autohemofusion, hence it may be used in the smallest hospitals.
5. Autohemofusion is a life-saving measure, especially for patients in imminent danger, and should be used in all cases with free intra-abdominal blood.
6. The morbidity and mortality is the lowest in the cases operated on immediately after diagnosis was made.
7. In case of doubt as to diagnosis, puncture of the posterior cul-de-sac is indicated.

3875 Wilshire Boulevard.

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DISCUSSION

EDWARD N. EWER, M. D. (251 Moss Avenue, Oakland).—The success attending the procedure of intravascularization of the free peritoneal blood, in Doctor Tiber's series of 123 cases, is impressive. Considering the showing made for it, we must admit a broad field for autotransfusion; for neither donors, nor the fees to be paid to them, are always quickly available.

At present, if donors are easily to be had, I feel safer in transfusing and operating when the blood pressure and pulse have reacted. They usually do react in a short time, often within an hour.

An Alameda County Hospital patient was operated upon, pulseless, in profound shock and she succumbed. Four hundred and fifty cubic centimeters of citrated blood had been given during the operation. It seems unlikely that the substitution of the intraperitoneal blood would have secured a different result, but waiting for a reaction after the donor transfusion might have done so.

The slow intravenous injection of gum glucose solution, so much used at the New York Women's Hospital to combat shock, is highly efficient, and might profitably precede operation and autotransfusion. It is available in 300 cubic centimeter ampoules, ready for use.

Doctor Tiber notes that, as usual, there were many cases incorrectly diagnosed. Several of these were pyosalpinx and tubo-ovarian inflammations. In all hospital statistics it is found that many patients with ectopic pregnancies have histories suggestive of pelvic inflammatory disease, so the frequency of that admission diagnosis is not surprising. The author suggests that attention to the temperature curve, the leukocyte count, the palpation of masses, and especially the examination of smears, might determine the diagnosis. All these are valuable, and must be given full consideration; but the great importance of the blood sedimentation test is not mentioned.

In the Alameda County Hospital, sedimentation tests are made in the admission department on all cases in which abdominal infections are suspected. Even if tubal pregnancies were handled on the obstetric, instead of, as at present, on the gynecologic ward, they would still have the benefit of that test in the differential diagnosis. Of the last twenty-four cases in that hospital operated upon for tubal pregnancy, eleven had sedimentation rates over one hour, three between forty and fifty minutes, six between thirty and forty minutes, and two between twenty-five and thirty minutes. One, with a coincident salpingitis, and another with infection following a previous office curettage, had twelve- and thirteen-minute rates. No uncomplicated case had a rate under twenty-five minutes.

The rate is twelve to fifteen minutes, using the Linzenmier tube method in fully 95 per cent of the cases of pelvic inflammatory disease, with symptoms comparable in severity with those attending a ruptured pregnant tube. This test, consuming but a few minutes of time, will at once partition off the inflammation cases, thereby greatly aiding diagnosis.

Aspiration of the cul-de-sac is an extremely useful diagnostic aid. I have used it many times without accident, and consider it safe in careful hands.

When pregnancy is certain, and the question lies between intra- and extra-uterine, and palpatory findings are suspicious, and the uterine bleeding is sufficient to indicate disruption of the ovum if in the uterus, then curettage seems indicated. If no ovum is dislodged by the curette, laparotomy may be done at once.

Doctor Tiber has done us a distinct service in reporting a large enough series of autotransfusions to inspire confidence in the method. One should bear in mind his advice, that it is most useful and devoid of danger in the early hours after rupture, before changes have taken place in the blood to be injected.

JAMES C. DOYLE, M. D. (1930 Wilshire Boulevard, Los Angeles).—Doctor Tiber, with his data relative to age, symptoms, and findings, has presented an interesting paper on ectopic gestation. The early surgical intervention in so many cases is commendable.

That eighty-five, or 34.2 per cent, of the two hundred and forty-eight cases had not missed a period is significant. However, in this group are probably those who "went over five or six days," and it is felt that this "lateness" is as important as a missed period in the presence of other symptoms characteristic of ectopic pregnancy. It is well known that it is at times extremely difficult, even after rupture, to make a correct diagnosis. Salpingitis is more frequently confused with ectopic pregnancy than any other condition.

The "sedimentation test" will, I believe, in many cases prevent this mistake. The sedimentation time in acute salpingitis is from ten to fifteen minutes, while in ruptured ectopic gestation for the first twenty-four hours following rupture, the time will be close to normal, sixty minutes or more. Each day, however, makes the sedimentation time more rapid, due to protein absorption and peritoneal irritation of free blood.

The utilization of the free blood, by means of autohemofusion, should be more generally employed. The technique is quite simple, and the results, as Doctor Tiber has shown, are most gratifying.

The hormone test (Aschheim-Zondek or Friedman) is a valuable aid to diagnosis of pregnancy; but should there be a ruptured ectopic pregnancy, a wait of forty-eight hours for completion of the test would be hazardous.

Needling of the cul-de-sac as a diagnostic aid should be done, I believe, only as a last resort.

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R. GLENN CRAIG, M. D. (490 Post Street, San Francisco).—Doctor Tiber has very ably presented to us the results obtained in ectopic pregnancies, emphasizing the importance of autohemofusion as an adjunct to treatment. Without question, this is a valuable addition to our armamentarium, and often a life-saving measure, especially with patients who have had a tubal rupture with a large amount of fresh blood free in the peritoneal cavity. However, I am inclined to disagree with his conclusion that it is devoid of risk.

One death, with an autohemofusion, was due to a "blood dyscrasia" which might not have occurred had the autohemofusion been omitted. Another patient died from a "blood dyscrasia," who had an autohemofusion and a direct transfusion. Assuming that the blood-matching was properly done for the direct transfusion, this death must be attributed to the autohemofusion. The deaths due to intestinal obstruction, embolus, diabetes, pneumonia and secondary hemorrhage, have no bearing on the subject.

The mortality rate (0.81 per cent) among the 123 patients who had an autohemofusion compares most favorably with the mortality rate (2.8 per cent) of the general group. When an autohemofusion is done, the hemorrhage into the peritoneal cavity must be recent—less than three days old—and the fact that these patients were more promptly operated upon may be a factor in the lower mortality rate.

Autohemofusion would seem to be of greatest value in an ectopic pregnancy with tubal "rupture." In these patients the growth of the fetus, with the erosion of the tubal wall by the trophoblastic cells, causes an actual rupture of the tube with the sudden loss of large amounts of blood. While this usually produces the "classical" textbook picture of an ectopic pregnancy, it is not as common as the termination of the pregnancy by a tubal abortion, or the extrusion of all or parts of the fetus and placenta through the fimbria of the tube. The latter causes the loss of varying amounts of blood, depending upon the amount of separation which takes place at one time, and may be recurrent whenever a new portion of the placenta separates. Pain, in any portion of the peritoneal cavity, is due to the local irritation to the parietal peritoneum caused by the free blood. Careful attention to the

details of the history will enable one to reconstruct clearly the various steps in the underlying pathology.

It is interesting to note that no change has occurred in the fundamental treatment since the rules drawn by Lawson Tait from his first three patients in 1883. He recognized, first, the necessity for an immediate operation, and secondly, the necessity for a quick operation. These two points may be illustrated by quoting his case reports.

In 1881 Doctor Tait was called into consultation by Doctor Hallwright when the patient was found in collapse and the uterus fixed by a doughy mass. The diagnosis of a ruptured ectopic pregnancy was made, and surgery was suggested and even urged by Doctor Hallwright. Tait lacked the courage to operate. A second hemorrhage killed the patient. A postmortem examination was held and the specimen injected. Tait found that the hemorrhage could easily have been controlled by a ligature.

In 1883 Doctor Tait was called to see a young woman of twenty-nine who was in collapse. Her history was that of an ectopic pregnancy with hemorrhage from rupture. She had missed but one period. Bed rest was advised and the patient improved. However, on the fifth day the patient got up and had another attack. Doctor Tait was called and operated immediately, removing clots, serum and debris. He found a ruptured left tubal pregnancy. He tied the left broad ligament, removed the pregnancy, washed out the abdomen, and put in a drainage tube. Nine days later the patient was convalescent.

A few months after the above patient he was called to see another patient "dying from hemorrhage." Immediately he opened the abdomen and found a fetus of twelve weeks, surrounded by clots, with the placenta adherent to the intestines. In an effort to be gentle he separated the adhesions too slowly, and was unable to ligate the vessels before the patient died. He, therefore, decided henceforth to operate quickly. Among his next thirty-nine patients he had only one death—a mortality rate of 2.56 per cent.

These principles laid down by Tait are just as true today as in 1883, but autohemofusion is probably the most important fundamental contribution of recent years.

PHYSIOLOGY OF THE SENSE ORGANS— SOME RECENT ADVANCES*

By J. M. D. OLMSTED, Ph.D.
Berkeley

DISCUSSION by Chauncey D. Leake, Ph.D., San Francisco; William J. Kerr, M.D., San Francisco; Herman Adler, M.D., Berkeley.

GIVEN the situation of the schoolboy, the bent pin, the teacher, and the teacher's chair, we will take it for granted that the introduction of the point of the bent pin into the epidermis of the pedagogue causes in the latter a sensation of pain. Philosopher, psychologist, physiologist, physicist, and physical-chemist, all recognize that there is an unsatisfactory gap between the two events, (1) entrance of the pin into the pedagogue's epidermis and (2) his sensation of pain. To quote from Adrian, "If we belong to the extreme left wing of the behaviorist school, we may deny that the arrival of a sensory message produces anything except a further series of physical and chemical changes in the central nervous system, a complex of excitation and inhibition processes, and passages of impulses to and fro, ending in a

* From the division of physiology, University of California Medical School, San Francisco.

motor discharge or in the laying down of some kind of pattern in the cortex. If we are on the right wing of the idealists, we may hold that nerve fibers and nervous impulses are ideas, and are therefore made of the same stuff as the sensations they produce. But if we have dabbled in metaphysics, and never succeeded in adopting any firm beliefs, we must admit that our sensations are facts to be reckoned with, and that they are facts of such a kind that it is very odd that they should be 'caused' by physical and chemical changes in the brain. To many of those whose concern is with the body or with the material world, it may not seem odd at all."

HOW SENSATIONS ARE AROUSED

We will first examine into the way in which our sensations are aroused. The receptor, the sense organ, is a structure so designed as to respond to a certain kind of stimulus, and a stimulus is defined as a change in the environment.

As an illustration, let us trace the train of events which must take place before we can say "I see a certain object." The stimulus, that is, the change in the environment of the retinal cones which are going to be acted upon, must be, first of all, what we may describe as radiant energy; it must have a wave length lying between four and eight ten-thousandths of a millimeter; and it must be above a certain minimum intensity. Then and then only will it initiate some change in the retinal sense organ. Once the change in the environment brings about the change in the sense organ, this second change now initiates a nerve impulse in the nerve fiber which is in contact with the sense organ. Older measurements indicated that the nerve impulse in man traveled toward the brain at the rate of one hundred and twenty meters per second, but very recent experiments show that the rate may be as slow as forty meters per second for motor nerves, and four to twenty for sensory nerves. We would like to be able to say that this nerve impulse passes over a definite pathway like a telephone line to a definite region in the central nervous system, but it is much safer to say that all the evidence indicates that the disturbance must pass first to the thalamus and, in this particular case under discussion, to the cerebral cortex before the individual can really be said to have "seen" the object. The central end of the line is at present being investigated in the laboratory of Doctor Erlanger of St. Louis, and in January, 1933, there appeared two papers by his associates on the cortical response to optic nerve stimulation, using the cathode ray oscillograph to demonstrate the response. Under the proper anesthetic, a rabbit's eye was removed, and the optic nerve prepared for artificial stimulation by electrical means. That particular part of the cerebral cortex to which the neurologist has traced the nervous pathways having their origin in the eye, was supplied with leads to the cathode ray oscillograph. When the optic nerve was stimulated, characteristic electrical changes were registered from this cortical area. Clearly, then, we have physiological proof that impulses set up in the eye do finally

reach the brain and set up electrical disturbances there. The belief that conscious perception must be correlated with physicochemical changes in the brain tissue is greatly strengthened by these recent experiments.

SPECIFIC NATURE OF ONSET

Now the strange thing about this chain of events is that they *begin* in a specific manner, a specific change in the environment, acting on a specific sense organ; but when the disturbance has once reached a nerve, all specificity appears to be lost. So far as physiologists have been able to discover, even with the help of the physicist, the chemist—and the electrical engineer, for that matter—all nerve impulses are essentially alike. They naturally differ in magnitude according to whether they are registered from a large or a small nerve; they may differ in their rate of transmission, also, according to the size of the nerve; but whether the impulses are registered from a motor nerve giving rise to motion, or a sensory nerve giving rise to sensation, they all appear to have the same physiological characteristics. It is strange to think that the nerve impulses started toward the brain by the odor of a skunk are probably no different from those set off by the odor of a rose; that impulses which give rise to sensations of pleasure may be in no wise different from those which give rise to pain. It would seem that nerves bear no more specific relation to sensation than the telephone wire does to its message. It must be remembered, however, that practically all our knowledge of the nerve impulse is based on the swing of a pointer on the dial of a sensitive galvanometer or on the analysis of the chemical changes taking place during stimulation.

PAIN AND OTHER SENSATIONS

Physiologists earlier in this century thought that pain should be placed in a different category from other sensations. If you map out the distribution of the sense organs in the skin, the touch spots, hot spots, cold spots, etc., and act on any one of them with the appropriate stimulus, the characteristic sensation of touch, heat, cold, etc., will be aroused. But if the stimulus is intense, a sensation of pain will be aroused. Von Frey said that the pain endings are so numerous and so close together—some one hundred to two hundred per square centimeter of about four million over the surface of the body—that the intense stimulus intended for another kind of organ would affect the contiguous pain organs. Physiologists in general have accepted this view. Goldscheider, on the contrary, has very recently revived the older idea and believes that painful sensation may be aroused by intense stimulation of receptors for mechanical changes, such as pressure by a blunt object which deforms the skin.

There is some evidence that Goldscheider's view may be correct for pressure pain; but at any rate it seems evident that the nerve fibers concerned with such dual reactions are not the only ones concerned with pain, and probably not even the usual ones.

NERVE IMPULSES IN RELATION TO SIZE OF NERVE FIBERS

It is now a well-known fact that nerve impulses are conducted at a more rapid rate in large nerve fibers than in small ones. Certain investigators, Ransom among others, have produced evidence that fine nonmedullated nerves, with slow conduction rates, are concerned with pain. Adrian suggests that sense organs may be arranged in a series: at one end of the scale are tactile sense organs which are very sensitive and whose nerve fibers are large and conduct rapidly; at the other end of the scale are pain organs, responding only to intense stimuli, whose nerve fibers are small and conduct slowly; in between these extremes we may have sense organs, for example, for pressure, which partake of both characters, depending on the strength of the stimulus.

Some work I did in Brussels two years ago bears out this idea. I was measuring the chronaxie of certain nerves. The chronaxie of a nerve is time necessary to excite a nerve with an electric current of twice the threshold strength. The absolute value of the chronaxie is at the moment a matter of debate, but if chronaximetric determinations are made in exactly the same way throughout an experiment, there is no doubt that the results are of value for purposes of comparing degrees of excitability. I was determining, first, the chronaxie of a typical motor nerve to a certain muscle in the leg of the decerebrate cat; second, the chronaxie of the sensory nerve necessary for setting up a typical reflex movement of this same leg muscle, the result presumably of a painful stimulus; third, the chronaxie of the sensory nerve from the lungs necessary to cause change in breathing, the customary quick gasp after a painful stimulus; and fourth, the chronaxie of the sympathetic nerve controlling the pupil of the eye and the nictitating membrane, that third eyelid which can be drawn over the cat's eye. I had for comparison, therefore, the excitability of the typical large motor nerve, typical pain nerves for producing the reflex withdrawal of the limb and for causing a gasp, and finally of small sympathetic nerve fibers. I found that the chronaxie for the motor nerve and its reflex were the same, and that the others were only slightly larger, that for the sympathetic nerve being the largest. Now since Lapicque has shown that the chronaxie varies inversely with the diameter of a nerve, had the pain fibers causing the pulling away of the leg been exclusively nerves of small diameter, then that chronaxie should have been much larger than it was. The conclusion I drew from these experiments was that, for these particular reactions, there is no evidence that pain fibers are exclusively small fibers.

SIZE OF NERVE IMPULSES

There is another character of the nerve impulse which should now be mentioned. If we stimulate a nerve directly, as we can easily do in physiological preparations, by artificial means, instead of through sense organs, we find that the magnitude

of the nerve impulse in the individual fibers, as measured by the difference of potential developed in the nerve as the impulse passes by, is the same, no matter what the strength of stimulus used. Thus, whether we use a small electric shock to set off an impulse or a powerful one, if the nerve fiber responds, it responds to its fullest extent or not at all. In addition to being nonspecific, therefore, the nerve impulse of a given nerve appears to be practically invariable as to its size. Of course, if a nerve is compressed and cooled and the blood supply checked, or if it is subjected to the influence of alcohol or other narcotics, the magnitude of the nerve impulses suffers; but the only more or less *normal* way to alter the size of nerve impulses is to send them along the nerve so fast, something like a thousand a second, that each one treads on the heels of its predecessor. They do become smaller and somewhat irregular under these conditions. But the usual rate of discharge from normal stimulation of a sense organ is only one hundred per second, and this most nerves can follow with a considerable margin of safety.

If, therefore, the nerve impulses set up by the sense organs are nonspecific and practically invariable as to size, how can we account for the undeniable fact that our sensations are qualitatively different one from the other? The point seems to be that these nerve impulses land up in different parts of the central nervous system; it is the location of the central receiving station that is all-important. Johannes Müller, author of the first modern textbook of physiology, said: "If you could connect up the ear with the optic nerve, and the eye with the auditory nerve, you would see thunder and hear lightning." This precise experiment has as yet not been done. But we have switched other pairs of nerves in animals and made each one of the pair do exactly opposite to what it would have done naturally, simply by causing it to grow into a region other than its usual one.

NERVE CONDUCTION WHEN THE LINE IS TAPPED

But there is another recently discovered and most startling feature of nerve conduction, at least in one certain nerve. This startling discovery came from tapping the line, as it were, between the sense organ and the brain. The auditory nerve is short and thick, is surrounded by bone, and is difficult to insulate electrically. One would think that the difficulties in attempting to get electrical records from it were almost insurmountable, but two psychologists at Princeton, Wever and Bray, in 1930 gallantly made the attempt. Instead, however, of connecting the leads from this nerve to string galvanometer, capillary electrometer, cathode ray oscillograph, or other device for recording electrical disturbances, they connected them to an amplifier and a loudspeaker, with the surprising result that words spoken by a person into a cat's ear were actually reproduced from the loudspeaker. This was almost unbelievable, and

although there are some scientists still unconvinced, so many others have repeated and confirmed the Wever-Bray results, that I am inclined to believe the case proven. The most convincing confirmation has come from the physiological laboratory at Harvard. A stethoscope was attached to the ears of a decerebrate cat and sounds were made into the bell of the stethoscope. Leads from the auditory nerve were connected with a loud-speaker. Doctor Cannon has informed me that with good contacts, when a loudspeaker is connected to the cat's auditory nerve, one cannot only detect words, but also the timbre of the voice of the person who speaks into the stethoscope. By exploring the brain tissue with a needle electrode, only the very tip of which was non-insulated, it was found that the response became more intense as the auditory tract was approached. In fact, when the leads were connected to a string galvanometer with one stage of amplification, electrical responses from the brain were obtained *only* when the needle lay in or on the auditory tract; a shift of as little as one millimeter sufficing to raise the response through a maximum and to cause it to die away entirely. When the cat was more deeply anesthetized this effect disappeared. If novocain was injected on one side of the brain, responses on this side only ceased, the other side still gave the response; and finally, after two to three hours, when the narcotic had worn off, the responses returned. When the cat was dying, responses from the brain stem ceased as soon as the heart stopped beating, or even a few minutes before; responses from the auditory nerve persisting for some minutes after the heart had stopped. This is in harmony with the known survival of nervous tissue: central responses go first, responses in peripheral nerves persist to a slight degree after death. These results seem to me to be fairly adequate proof that the Wever-Bray effect is really a physiological one, not an artifact.

NERVE VIBRATIONS AND THE HUMAN VOICE

If all nerve impulses have essentially the same electrical character, and are all more or less of the same intensity and have an absolute maximum frequency of one thousand per second, how is it possible that they can give rise to vibrations which so accurately duplicate vibrations of such different rates and amplitudes as are to be found in the human voice? It must be remembered that the human ear is capable of perceiving about eleven thousand different pitches in all. Practically every text-book of physiology will tell one that the ear acts as a resonator. Nearly two centuries ago—to be exact, in 1761—the resonance theory of the action of the cochlea was proposed by Cötugno. It was again advanced by Sir Charles Bell in 1826; but because of his admirable work on this subject in 1863, this theory is always associated with the name of Helmholtz. According to the resonance theory, sounds of a given pitch cause vibrations in certain fibers only of the basilar membrane in the cochlea. These fibers are in contact with a

limited number of sensory cells, which in turn are innervated by certain nerve fibers. Therefore only a relatively few nerve fibers in the tract from the ear to the brain are busy for a particular vibration rate. For another pitch, other fibers would vibrate, other sensory cells would respond, and another lot of nerve fibers would be set into action. The opposing theory, the telephone theory, postulates that the membrane vibrates as a whole, just as the diaphragm in the telephone receiver vibrates as a whole in response to sound waves. In this case the auditory nerve must also act as a whole, and analysis would not take place in the cochlea but in the brain. This theory has never been accepted for the very reasons given above, namely, the known characteristics of the nerve impulse, the objection being stated thus by Hartridge: "The telephone theory assumes that the auditory nerve can conduct complicated wave forms, intact as to pitch and amplitude, at rates up to forty thousand per second." Now this is just the sort of thing that Wever and Bray have found. Adrian remarks, "It is, I think, an open question whether there will be much left of the resonance hypothesis of the cochlea when Wever and Bray have finished their investigations."

How to reconcile facts (if you believe that the Wever-Bray effect is a true physiological response and not an artifact) and theories? The explanation offered is that not a few fibers only, corresponding to a few sensory cells in the cochlea, are set in action by a sound of a given pitch, but many. They are not all set off simultaneously, however, but in a series, so that the composite effect for the whole nerve, that is, the sum of all the individual differences of potential in all the different individual nerve fibers, is of such a nature that the response appears in the form of sinusoidal oscillations, and reproduction of the stimulating sound is, therefore, possible by appropriate recording of these nerve impulses.

SOUND IN RELATION TO PHYSICS, CHEMISTRY, AND PHYSIOLOGY

Physics and chemistry must always be one jump ahead of physiology, so that only just now have physiologists adopted the prevailing fashion and begun to play with amplifiers, heterodynes, loud-speakers, and all the other accompaniments of radio. We have seen how the amplifier and loud-speaker is upsetting a two-century-old theory concerning the action of the organ of hearing. Amplifiers attached to the galvanometers we have used for some time to register the effects of the nerve impulse have proved especially helpful, and it is through amplification with a four-valve amplifier that Adrian, whose work has brought him recognition in the form of the Nobel prize (which he recently received conjointly with Sir Charles Sherrington), has been able to record the electrical changes in a *single fiber* of a large nerve trunk. The delicacy of this procedure is evident when one realizes that the diameter of one of these fibers is about fifteen one-thousandths of a millimeter.

ELECTRICAL MANIFESTATION OF THE NERVE IMPULSE

Now the prevailing theory to account for the electrical manifestation of the nerve impulse is that the point on the nerve which receives the stimulus becomes momentarily depolarized. Our sole "proof" for such a theory is again drawn from analogy. F. R. Lillie has made a model of a nerve out of an iron wire. He places the iron wire in strong nitric acid, and a protective film, presumably an oxid, is formed, and the wire is no longer attacked by the acid—it has become passive. If, however, this protective film is broken at some point, a wave of surface disintegration passes along the wire, and the surface film is reformed in its wake. So many of the characteristics of the nerve impulse may be duplicated by this model, that physiologists feel justified in adopting this depolarization theory to account for the nerve impulse.

Now Adrian last year extended this analogy to the sense organs. He suggests that in sense organs the effect of the stimulus is also depolarization, which in turn depolarizes the nerve, and initiates the nerve impulse. Again, one must recognize that this is only a suggestion—we are guessing what the change in environment does to the sense organ to set it off.

ELECTRICAL CHANGES IN SENSORY NERVES

But let us return to the more tangible results Adrian obtained when he recorded the electrical changes in sensory nerves which pass from the sense organs toward the central nervous system. In the first place, he had to decide that his results were real results, not artifacts. The preparation he used was that most familiar to physiologists, the gastrocnemius muscle of the frog with its attendant sciatic nerve. He fixed the muscle so that it could be gently stretched without disturbing the nerve, and placed the electrodes leading to the galvanometer on the nerve. When the muscle was gently pulled, a series of electrical disturbances was registered by the galvanometer. When these disturbances were photographed they showed exactly the same characteristics that we have long been familiar with for nerve impulses going to muscles where we not only have the electrical record from the nerve, but the contraction of the muscle to assure us that these responses are genuine. Simply stretching the muscle, therefore, gave rise to nerve impulses going away from the muscle toward the central nervous system. Crushing the nerve, or injuring it so that it could no longer conduct an impulse, abolished the responses. The results were no artifact, but a truly physiological response to stretching the muscle. We have known for some time the particular sense organs which must serve this purpose in the muscle, the muscle spindles. These sense organs are responsible for conveying to the brain the amount of tension present in a muscle, and the evidence shows that they are located in the fleshy part of the muscle, not in the tendons, as many have thought; for although such responses in normal

animals are called tendon-jerks because they may be elicited by striking a tendon, for example, the well-known knee-jerk obtained by striking the patellar tendon just below the knee cap, they may be obtained even after the tendon has been cut away.

Now, nearly every muscle has these muscle spindles, and Adrian's brilliant teacher, Keith Lucas (who was killed in an aeroplane accident in the war), investigated an exceedingly small muscle which goes from the skin of the back of a frog to the body wall. The nerve to this tiny muscle has fifteen to twenty fibers only, as contrasted with, say, the nerve to the calf muscle, which would have some five hundred fibers. When this muscle is stretched by hanging a two-gram weight on it, the muscle spindles are stimulated, and the electrical charges in the nerve indicate that impulses of a certain magnitude pass up the nerve at a slightly irregular rate of approximately one hundred per second. If a smaller weight is hung on the muscle, the *size* of the nerve impulses remains the same, but the frequency diminishes. To record the action of one sense organ, Adrian carefully trimmed away an edge of the muscle; the rhythm of responses in the nerve fell clearly into four perfectly regular series, recurring at intervals of .035, .042, .045, and .046 seconds, respectively. Another strip of muscle was removed and now only the responses at .035 were left. When still another strip was removed the responses ceased. The strip before the last contained one sense organ only. One fact brought out by this experiment which appears most astonishing to the lay reader is that no matter what the strength of the stimulus, two grams down to a fraction of a gram, the magnitude of the nerve impulse did not alter, only the frequency at which the impulses passed over the nerve. More pull, therefore, does not make bigger nerve impulses; it only causes them to pass more frequently. Yet, we should expect this result from our knowledge of the way nerves act. They obey the "all or none" principle. Physiologists are accused of being too ardent in their worshiping at the shrine of this law, but it never fails them. It does seem strange, however, that increasing the intensity of the stimulus merely makes the nerve impulses go faster. Adrian has studied not only the stretch organs in muscles, but pressure organs, touch organs, pain organs, and the retina as well, by recording the changes of potential in their nerves when the organs are stimulated, and the result is always the same: increase in intensity of stimulus increases the rate at which the volleys of nerve impulses are shot off.

How does this accord with our own experience, that is, what is the relation between sensation and stimulus? Let us refer back to our original illustration of the boy, the teacher, and the bent pin. If the teacher sits down suddenly on the pin, there results a sharp, vivid sensation of pain, which dies away when the stimulus is removed. On the contrary, if the teacher decides to be a martyr and lowers himself gently onto

the pin, allowing the point to enter his epidermis gradually, the pain will gradually increase with the penetration of the pin. Adrian tried this on a decapitated cat. Now the decapitated cat is legally dead, since it has no head whatsoever, and therefore satisfies the antivivisection laws of England; it must be insensitive to pain because it has lost the seat of its awareness, namely, its thalamus. But physiologically you can keep a decapitated cat alive for two days by administering continuous artificial respiration and keeping its temperature normal. Such a headless cat will kick when its toe is pinched and in many ways astonishes the nonphysiologist when he sees such a preparation. Adrian arranged a sharp pin in a rod and could bring it down suddenly on the sensitive pad of the foot, or by means of a screw could drive it slowly into the flesh. In the first case the frequency of discharge of nerve impulses rose almost at once to a maximum, then after three to four seconds fell off almost equally rapidly; but in the second case, if the pin was gradually pushed into the skin during a period of half a minute, the increase in frequency of nerve impulses kept pace with the penetration of the pin into the skin.

IN CONCLUSION

It seems to me that this experiment is most fundamental. It shows the type of information which our minds get from our sense organs, and it shows the relation between sensation and nerve impulse frequency, and, what is more important, it means that the mental correlate is a very close copy of the physical events taking place in the sensory nerves.

I cannot do better than conclude with the final sentence of Adrian's little book, "The Basis of Sensation." He says of his work: "It does not bridge the gap between stimulus and sensation, but it shows, at least, that the gap is a little narrower than it was before."

Division of Physiology,
University of California Medical School.

DISCUSSION

CHAUNCEY D. LEAKE, PH.D. (University of California Medical School, San Francisco).—CALIFORNIA AND WESTERN MEDICINE may be proud of affording an opportunity for the occasional presentation of a general review of significant recent advances in the medical sciences, such as Professor Olmsted's thoroughly delightful "Physiology of the Sense Organs." This is a feature which has made the *Lancet* so valuable to English physicians. Professor Olmsted's charming review is in the best English tradition of sound work wittily interpreted.

The ideas discussed by Professor Olmsted are important not only for the neurologist but for all specialists and the general practitioner as well. One need only consider the manifold derangements which may occur in the receiving apparatus, the conducting system or in the interpreting mechanism, to realize how readily the various disturbances of sensation in disease may arise. Anything interfering with blood or oxygen supply to nervous tissue, or with lipid metabolism in it, may cause all degrees of malfunction. Practically all drugs, if given in large enough dosage, have some effect on sensation. The mechanism of their various effects in this respect is scarcely investigated, even for general and local anesthetics, or even for morphin, the most satisfactory agent known for the continued

relief of traumatic pain. In congestive pain, one may explain the relief afforded by the aromatic analgesics and antipyretics on the basis of Barbour's brilliant studies, which show that these drugs pull water out of such tissues back into the blood, from which it may be lost by passage into the urine and by sweating. The afferent nerve fibers lying along the blood vessels in the viscera, the meninges (*Proc. Soc. Exp. Biol. Med.*, 26:288, 1929), in muscle, bone, and teeth, seem peculiarly sensitive to pressure changes. This has been discussed with reference to headache (*Journal of the American Medical Association*, 88:1076, 1927), one of the commonest of disease symptoms, and is obvious in toothache.



WILLIAM J. KERR, M.D. (University of California Medical School, San Francisco).—Doctor Olmsted has pointed out some of the recent and most brilliant contributions in neurophysiology which should be of interest to clinicians confronted so often by disturbances in sensation which cause patients to seek relief. The spirit of inquiry may be strong, but unless the fundamental laws governing the functions of the units in the nervous system are known we are led to fruitless speculation. The discoveries discussed represent true advance.

If sensory and motor nerves serve merely as conductors of electrical impulses, and vary only in the rate of conduction and reception, the mechanisms on either end of the pathways must impart the qualities to sensations to bring about effective response on the motor side.

In the eye the sensory end-organs are modified or adapted for special needs. In the average person the bands of light (radiant energy) embraced within a narrow range of the spectrum stimulate the retina, and for most purposes the extent of the "visible" spectrum is alike in different subjects. However, variations in color perception occur if we are to explain the weird representations of color depicted by some artists and artisans (differing from ourselves who belong to the more numerous group) who deal with colors. The pleasing qualities of certain tints and shades to individuals may be due to alterations in the development of the receptor mechanism in the retina or registration in the brain. Color blindness is an example of disordered perception or registry; and it is of interest that those so afflicted may observe beautiful color effects, *e. g.*, at sunset, when the average person would consider the sky dull and colorless, and would observe no brilliancy of coloring when to most of us the effects were dazzling.

It is, perhaps, more rational to accord to the cochlea the ability to select certain frequencies by means of special sensory endings and to transmit them through separate fibers to the brain. However, work which we have done with the reception, transmission and registration of sound indicates that it is possible to select bands of frequencies by a system of electrical "filters" at any point along the conduction pathway and analyze the composite sound with fair accuracy. It is possible that this analysis of sound in hearing actually takes place in the brain through special development of synapses or the terminal cells. If different frequencies could be transmitted simultaneously over given fibers, it would be necessary to assume the existence of an apparatus for selection at each end of the pathway, tuned so that the bands of frequency would not interfere as in the multiple transmission over telephone circuits. The experiments of Wever and Bray are very ingenious, and further study along these lines should be fruitful.

In the Clinic we use special apparatus to reproduce stated frequencies, within the range of audible sound, to study patients with deafness. It will be found that there are patients with gaps in the normal range of hearing, some bands or frequencies failing to register. In such instances we may suspect defects of the receptor mechanism or in the registration apparatus at the thalamus or beyond in the cortex.

It would appear that the specialized sense organs of taste and smell offer fields for further study. The importance of association in interpreting sensations from these sense organs is apparent.

In the Clinic we are confronted daily with problems related to the peripheral sensations. The interpretation of sensations described by the patient is often of assistance in locating the seat of trouble. We have become accustomed to associate "burning" pain and "throbbing" with congestion, inflammation or swelling of the part; "sharp and shooting" pains with irritation of sensory nerve trunks or ganglia, or perhaps in the posterior bundles of the spinal cord; "dull" and "sickening" pains in the abdomen with forceful contractions of the large bowel; "colicky" pains with contractions of a hollow viscus like the gall-bladder or renal pelvis and their ducts; "vice-like" pain at the heart in angina pectoris; numbness and coldness with arrest of the arterial circulation to the extremities; and "tingling" or "pins and needles" sensations with throbbing when circulation is being restored. Space will permit only brief mention of examples of "imaginary" pain or abnormal sensations referred to the somatic areas, and designated as pain of psychogenic origin. Clinical experience teaches us that the mechanisms on either end of these sensory pathways may participate in the production of sensory phenomena.

Objective alterations in peripheral sensations are manifestly of great aid in diagnosis, especially in the localization of lesions in the pathways to the brain. The methods for testing the state of these sensory functions must be so devised that each one is tested separately. Ordinarily the patient cannot, unaided, distinguish the finer shades of disturbance because the stimulus may be widespread, affecting numerous and varied types of sensory endings. The character of the sensation noted by the patient may not conform to the objective observation. An area of skin in which pain is described may be relatively insensitive to pain or have an altered sensation of pain when pricked with a sharp point. The participation of the brain in these alterations is suspected, but in what manner we do not know.

The studies of Adrian, Lillie, Wever and Bray, Erlanger and Olmsted, are of very great interest to the clinicians as well as physiologists. How much of what is already known in the laboratory can be applied at the bedside is uncertain, but we can hope for a clearer interpretation of symptoms and signs on the basis of this work.



HERMAN ADLER, M.D. (1043 Life Science Building, University of California, Berkeley).—In the face of the achievements of the nerve physiologist, which seem more and more to approach the precision of the mathematical sciences, it is the pleasant rôle of the clinician to give respectful attention and to applaud. In this discussion of the physiology of the sense organs, Doctor Olmsted modestly refrains from enlarging on his own not inconsiderable contribution to our knowledge of sensation. Among the many important problems which the paper touches upon are several of great interest to the psychiatrist. The problem of sense perception and its relation to pathologic manifestations, such as hallucinations, has been a vexing one because of the difficulties in the way of experimental investigation. The literature is full of attempts at explanations and of various laboratory and clinical tests, but little precise information for development other than clinical or subjective observations. The experiments described by Professor Olmsted give some support to those who regard hallucinations as the result of physical changes somewhere in the path of the sensory systems, from the receptor organs to the cerebral cortex. Such evidence as this bids fair to make a long step toward freeing psychiatry ultimately from the chain of metaphysical speculation and bringing it in line with the rest of the natural sciences.

MUSSEL POISONING

By WILSON STEGEMAN, M. D.
Crescent City

DISCUSSION by Hermann Sommer, Ph.D., San Francisco; J. C. Geiger, M. D., San Francisco; Wilfred H. Kellogg, M. D., Berkeley.

DURING the past summer five cases of mussel-poisoning were seen in Crescent City, the first time that mussels, gathered north of the Klamath River, have been found to contain poison. Other cases, some fatal, were reported along the Oregon coast, also for the first time. With the seeming enlargement of the territory in which cases of mussel-poisoning may develop, and with another summer coming on, it should be advantageous to mention some of the significant features of this little-described disease.

FORMER OUTBREAKS

No outbreaks of mussel-poisoning have ever been reported during the cold months, so that mussel quarantines, where imposed, have never been found necessary between the end of October and the first of June. The continually told theory, that all mussels gathered from below the low-tide line are safe was definitely proved a fallacy during the San Francisco epidemic in 1927. At that time 102 cases were reported within a few days, six of them proving fatal. K. F. Meyer and H. Sommer, of the Hooper Foundation, have very completely reported upon the epidemic and have done a notable work in investigating and tracing the origin of the cases. They followed through several factors, theoretical and practical, in the 1927 outbreak, and several subsequent smaller epidemics. Because some of the features and symptoms are extremely interesting, a few of the more constant ones may be worth a short review, as they were reemphasized by last summer's cases.

NATURE OF POISON

The origin of the poison found in mussels at certain seasons is not agreed upon. It is not a bacterial poisoning, there being present a preformed toxin analogous to the one found in certain mushrooms. Symptoms like those seen in humans may also be produced in animals, namely, paralysis, coma, and death. The disagreement as to whether the toxin is heat-resistant, or capable of destruction by boiling for a thirty-minute period, has little clinical significance, as mussels are seldom boiled, and certainly never for that length of time; the customary method of preparation being mere steaming until the shells are opened.

The reaction to mussel toxin generally falls into one of three classes. A gastro-enteric type of poisoning is seen, with vomiting and diarrhea, but is rather uncommon. As a rule there is constipation, rather than the opposite, and emesis must generally be induced artificially before it occurs. Otherwise there is a similarity to the usual case of acute food-poisoning. Fatalities rarely follow this type.

There is also the rather rare nervous type of reaction, in which occur itching, urticaria, dyspnea, and occasionally angina. Recovery generally follows in a few days.

CRESCENT CITY CASES

Although not usually in the preponderance, the third, or paralytic type of poisoning, was seen in all of the cases in Crescent City, in various depths of severity. The symptoms and findings resembled closely many of the cases reported during the San Francisco outbreak, although all of the patients had already taken large doses of emetics with good results when first seen. Without exception, all of the patients mentioned as their first symptom either a numbness, starting about the mouth and spreading over the face, or a tingling in the hands and feet, notably the fingers. Two patients, not severely sick, were in good condition the morning following the eating of their mussel supper.

Of the other group of three cases, one had, fortunately, just finished a detective story, depicting the symptoms of various types of poisoning, and was immediately suspicious when he noticed a numbness about his mouth some fifteen minutes after eating a meal consisting wholly of mussels. He insisted that all of his party start for medical help at once, stopping en route at the first farmhouse, where they each drank four or five glasses of warm salt water. They all vomited copiously, and the two most severely stricken probably owe their lives to this prompt elimination of much of the toxic material. They arrived in town, in shock, about two hours after eating the mussels and were put to bed. They staggered, complained of numb hands and feet, but mentioned a feeling of extreme "lightness." In spite of their gaits, they did not complain of dizziness. A liberal hydragogue cathartic was given without result. Their temperatures remained below 97 degrees for six hours, and cardiac stimulants were required for rapid pulses, which, however, remained quite full.

By the next morning one patient had recovered. Of the other two, one was able to stagger about the room, but the other immediately threw his body over backward whenever he tried to stand up without holding to the edge of the bed. In addition to disturbance of their vestibular apparatus, all muscle-sense was absent from the feet and legs, neither patient being able to tell whether his toes were being flexed dorsally or plantarward. The sensation of "lightfootness" was still very pronounced, and the gait severely tabetic. Neither patient could come within six inches of approximating opposite index fingers with his eyes closed. In spite of these features, the cutaneous senses were not disturbed, the deep tendon reflexes were not altered, and the feeling of dizziness only moderate. Mentality was not disturbed.

Both patients continued to improve steadily and without interruption, all of the foregoing symptoms and findings passing off gradually. By the fourth day only the positive Rhomberg and the tabetic gait remained, and they left the hospital.

By the end of a week both reported themselves in good condition, except for weakness and inability to do heavy work.

COMMENT

Severe poisoning, of the paralytic type, may follow the eating of mussels during the summer months, due to the occasional presence of a pre-formed toxin, the cause of which has not been determined.

The first noticed symptoms are generally a feeling of numbness about the mouth and tingling of the hands and feet, both of them symptoms so often mentioned by supposedly "neurotic" patients that they might be passed over too lightly by many physicians. Another significant, early complaint is a feeling of "lightness."

Recovery is generally complete and fairly quick. In the fatal cases death occurs in a relatively few hours from respiratory paralysis.

The approved treatment is the rapid elimination of the toxic material by emesis, followed by supportive treatment. Because the toxic material does not generally promote increased peristalsis or diarrhea, purges must be given promptly, and in large doses to be effective. However, in view of the rapid absorption of the toxin, the use of cathartics may be questioned, due to the additional shock imposed upon the patient. At the first sign of dyspnea, artificial respiration should be resorted to.

Knapp Hospital.

DISCUSSION

HERMANN SOMMER, PH.D. (Hooper Foundation for Medical Research, San Francisco).—The cases of mussel poisoning from Crescent City, reported by Doctor Stegeman, are of considerable interest from several standpoints. They are part of an outbreak of at least fifteen cases originating in five different localities between Crescent City, California, and Bandon, Oregon, from September 4 to October 1, 1933. Most of these were unusually severe; one man died in less than three hours after the meal, while many of the others were saved only by prompt medical attention. Laboratory tests, likewise, showed the mussels from this outbreak to be of the highest degree of toxicity so far encountered.

Sporadic cases have undoubtedly occurred all along the coast of the Pacific Northwest ever since the arrival of the first white settlers. Severe outbreaks of recent years, however, have been confined entirely to the area between the Monterey peninsula and Fort Bragg. During the last seven summer seasons, 211 cases have officially been reported from this area, the outbreaks of 1927, 1929, and 1932 having proved specially severe. Experiences in the area of central California show that a strict quarantine from June 1 to October 1 is sufficient to prevent more serious epidemics. These recent cases from the northern district will make an extension of the quarantine for at least one month imperative. It is interesting to note, in this connection, that in 1933 the only outbreak in the central California area consisted of seven mild cases originating from one batch of mussels collected at Pedro Point on July 9. Concerning the northern limit of the area affected during the past season, we have only scant evidence. Mussels and clams of October 1 from the Coos Bay district proved highly poisonous in the laboratory, while samples from Cannon Beach, in northern Oregon, were entirely free of poison on October 18. That the northern limit had not been reached, however, is shown by two samples from the Puget Sound, of August 8 and September 17, respectively, which showed the same degree of toxicity prevalent at that time near San Francisco.

It is difficult to predict the chances for further disturbances along this part of the coast. The statistical evidence would indicate that mussel poisoning runs in cycles of several years' duration, and it is not unlikely that the cases described by Doctor Stegeman are the first of a series to follow during the next few years. Since mussels will always be consumed in spite of any quarantine measures imposed, it will be wise to be on the lookout for cases of this disease during the summer and early fall, especially in the northern part of the state.

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J. C. GEIGER, M. D. (1085 Mission Street, San Francisco).—As a result of scientific investigations carried on for a number of years at the George Williams Hooper Foundation for Medical Research of the University of California, the California State Department of Public Health has, for several years past and for suitable seasonable periods, issued warnings against the use of mussels as food. Cases of poisoning have been reported particularly in counties north of San Francisco. Previously, Meyer, Sommer and Schoenholz¹ had reported a source of danger in the mussel in California which evidently can be attributed to poisons that occur within the food itself. Though the origin of the poison was not definitely established, it was determined that the poison is not formed by bacteria, thereby eliminating the question of polluted basins; that the poisonous mussels cannot be distinguished from the safe; that the poison is heat stable in acid solutions, and also that the poison is probably the result of a metabolism disease influenced by the food and spawning condition of the shellfish. Apparently it may be necessary to establish, at least for California, and possibly for Oregon, a closed season for the summer months for the use of mussels.

Moreover, epidemiologic evidence is accumulating to the extent that, in areas of the California coast, the poisoning does occur periodically in an increased number of human cases. This periodic increased incidence was manifest in 1927, 1929, and 1932. Should this epidemiologic assumption be correct, then there may be anticipated for 1934 a marked epidemic recurrence of the poisonings in the selective seasonal periods, namely, the summer months, and particularly, June, July and August, provided like conditions in the mussels of previous high-incidence years obtain. The most interesting and valuable observation of recent research in these poisonings has been that of H. Muller,² of the Hooper Foundation, which shows that the addition of ordinary bicarbonate of soda to the cooked mussels, in such small amounts as a tablespoonful to a quart of material will, in experimental laboratory animals, either reduce the effect of the poison or quite often cause it to be avoided entirely.

The symptoms of tingling or numbness around the lips, and a prickly feeling in the finger-tips and toes thirty minutes or longer after eating mussels, should be notification to call for a physician immediately.

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WILFRED H. KELLOGG, M. D. (State Hygienic Laboratory, Berkeley).—Mussel poisoning comes in the category of accidental poisonings with food materials that are widely used and ordinarily harmless, but that for various reasons occasionally have lethal properties. Botulism is one where the poison is due to bacterial contamination and improper canning methods; mushroom poisoning to error in selecting a poisonous species; and poisoning by mussels, possibly due to physiological change, is to be guarded against by observing seasonal danger periods.

As Doctor Stegeman has observed, the explanation of this occasional toxic condition of mussels is not definitely known. The seasonal occurrence of toxicity, and the certainty that spoilage or bacterial toxins have

nothing to do with it, is suggestive of something analogous to the poisonous qualities of certain other forms of life in connection with ovulation; but the varying intensity in different years remains unexplained. Another possibility is that the poison has its source in some food supply of the shellfish, not, however, of a bacterial nature.

The varying symptoms that have been reported show that not all cases of mussel poisoning are due to the specific toxin. A few cases do not manifest the classical paralysis, but instead have gastro-intestinal symptoms or urticaria and dyspnea. The former can well be ordinary bacterial food poisoning, and the latter a manifestation of protein hypersensitiveness.

The prevention of mussel poisoning is entirely a matter of education. If knowledge of the possibility were universal, poisoning would be restricted to those who disregard the obvious precaution of eliminating mussels from the diet. There is nothing in the theory that mussels gathered below the low tide level are safe, or that cooking destroys the poison. Cooking, with the addition of a tablespoonful of bicarbonate of soda to the quart of water, does, however, destroy a considerable portion of the toxin.

THE RADIOLOGIST IN THE HOSPITAL— HIS STATUS*

By LOWELL S. GOIN, M. D.
Los Angeles

DISCUSSION by Henry Snure, M. D., Los Angeles; L. H. Garland, M. D., San Francisco; Charles M. Richards, M. D., San Jose.

THAT the relationship of the radiologist and the hospital, and the varying activities of hospital departments of radiology, present a problem will be generally admitted. That these relationships and activities offer a serious threat to the private professional activities of radiologists, and indeed to practitioners of medicine in general, is frequently postulated. Right or wrong, the physician feels that there is a growing tendency of the hospital to exploit him; to attempt to profit through his professional skill; and he fears that the end of it will be that he will become the hired employee of the hospital. The hospital, on the other hand, feels that the conduct of a department of radiology is an activity proper to the hospital; that it is, by the very nature of things, forced to conduct a department such as this, and that it is very likely that such a department may be made to show a profit.

PROBLEM OF THE RADIOLOGIST AND THE HOSPITAL

Obviously, the solution of a problem cannot be arrived at until and unless the problem is clearly stated. It is in the hope of stating this problem, as well as of helping toward its solution, that this material is presented. Just what is the problem, therefore, that we feel is present? We complain; we feel aggrieved; we say to each other that we are being exploited, that our professional prerogatives are being infringed upon. What is it that we complain of? Are we being exploited? Is the problem general? Or are we being confused by local situations arising from local jealousies, personal prejudices and the like?

*Read before the Radiology Section of the California Medical Association at the sixty-third annual session, Riverside, April 30 to May 3, 1934.

¹ Meyer, K. F., Sommer, H., and Schoenholz, P.: Mussel Poisoning, *J. Prev. Med.* 2:365 (Sept.), 1928.

² Muller, H.: Mussels and Clams—A Seasonal Quarantine—Bicarbonate of Soda as a Factor in the Prevention of Mussel Poisoning, *Calif. and West. Med.*, 37:263 (Oct.) 1932; 37:326 (Nov.), 1932.

TO WHOM A QUESTIONNAIRE WAS SENT

It was in the hope of being able to answer these questions, of being able to state clearly the problem, and of determining whether it is a sectional or a national situation, that questionnaires were sent to three hundred and seventy roentgenologists, representing practically the entire membership of the American Roentgen-Ray Society. Since the membership of this society is, in general, comprised of men of considerable training and experience, and since, in general, it might be expected that these would be among the established men in each community, and since the scope of questionnaires covered the entire United States, it is reasonable to assume that the conclusions drawn from the survey are a fair cross-section of the national condition of radiologists and their hospital relationships. In spite of the fact that 10 per cent is a fairly good return for a questionnaire of national scope, three hundred and sixteen replies (or over 85 per cent) were received, and it may be remarked that this figure indicates the degree of interest felt over the entire country in the whole question.

SOME REPLIES

The questionnaire was very simple. The most casual survey of the replies showed that almost everyone either misunderstood question No. 3—"Have you complete control of the department?"—or had not reflected deeply on the meaning of "control." Almost everyone answered this question with "yes," but answered question No. 4—"Who owns the equipment?"—question No. 5—"Who hires and discharges the technical and office help?"—and question No. 6—"Who pays the salaries of the department employees?"—with the words, "The hospital." Since it is still true that "he who pays the piper may call the tune," it is a little difficult to see just what control a man may exercise over a department owned and disciplined by a hospital, and conducted for the hospital's profit or at the hospital's expense. Therefore, it has been decided, purely arbitrarily, that the answer to question No. 3 shall be considered to be "no" unless the answer to question No. 5 is "the radiologist"; it being conceded that if the radiologist possesses disciplinary power over the various assistants in the department, he is, in fact, in control of it. No other changes have been made in any of the replies.

Of the 316 men who replied, 272, or 86 per cent, have a hospital radiological service. A considerable number have more than one service, so that 272 men serve 342 hospitals. Of these, fifty-three, or 21.8 per cent, are full-time employees of hospitals, and 190 are on a part-time basis. Stated differently, and from the standpoint of the number of hospitals served, fifty-three hospitals have full-time radiologists, while 289 hospitals have part-time men in charge of their x-ray departments.

TYPES OF COMPENSATION

About 6 per cent (fifteen) of the radiologists so engaged received nothing for their services. This peculiar phenomenon seems to be confined

to the eastern states, and almost entirely to New York City. Seventy-five radiologists (30.9 per cent) receive a salary for their services, while 154 (63 per cent) are allowed a percentage of the department receipts. Of those receiving a percentage, fifty (30 per cent) divide the net receipts of the department, while 104 (70 per cent) share in the gross receipts, the percentage received by the radiologist varying from 30 to 85 per cent of the gross.

The x-ray department is under the actual control of the radiologist in 124 hospitals, while in 177 hospitals he has no real control. In 218 instances the hospital owns the equipment of the department, and in eighty-seven hospitals the radiologist is the equipment owner.

The salaries of the department employees are paid by the radiologist in fifty-one hospitals, but by the hospital in 243 institutions.

Only in twenty hospitals is the radiologist not a member of the senior staff.

Two hundred and seventy-two radiologists derived 36.6 per cent of their professional income directly from their hospital connections. Only ninety-five of those reporting expressed themselves as dissatisfied, but it is very likely that this question was misunderstood, many having apparently considered the inquiry to be whether they considered themselves adequately paid for their services.

COMMENT ON THE ABOVE

From the foregoing we may now represent to ourselves, with reasonable confidence, the average radiologist in his relationship to the average hospital. He is a man having a private practice of his own, serving a hospital as its radiologist on a part-time basis, and being paid therefor by receiving a percentage of the gross receipts of the department. No fault can be found with this arrangement, provided:

1. That he is selected on the basis of his professional skill and reputation, rather than because he will accept a smaller percentage of the receipts than another physician.
2. That he is in control of the department.
3. That the division of the gross is on such a basis that the percentage retained by the hospital is that which fully covers the expense of conducting the department.
4. That he is a member of the senior staff.
5. That the hospital does not compete with him in his private practice, or at least that it does not do so on an unfair basis, such as lowering fees and the like.

COMMENT

But are these conditions commonly met? The twelfth question of the questionnaire which furnished this material concerned any comment the respondent cared to make. Nearly everyone answered this in from a few words to several pages of remarks concerning his own situation in particular, or the situation in general. It will be appropriate here to quote or give excerpts from a few of them: "They (the hospital executives)

feel that the x-ray department should be a money-making activity of the hospital."

(Speaking of the boards of trustees): "Their obsession is the use of the radiological department as a source of revenue for the hospital; an attitude that they never take toward surgery or where other staff members are concerned."

"The directors (of the hospital) want an increasing percentage as the volume is increased by the efforts of the radiologist."

"There is a definite tendency on the part of hospital administrators to exploit the roentgenologist." (There were a great many comments of this nature.)

These remarks, chosen from many because they are by men in widely separated parts of the country, voice the feeling of nearly every radiologist: That the hospital has no right to profit by the conduct of its x-ray department, because the activities of that department are essentially those of its director, the radiologist, and are therefore purely professional. For this hypothesis we have formidable support. The Council on Medical Education and Hospitals of the American Medical Association has stated plainly that radiology is the practice of medicine, and has long recognized it as a medical specialty. One of the sections of the scientific assembly of the association is that of radiology. The Council of the California Medical Association has taken the same position. One may, therefore, confidently say that the use of the x-ray in and for the diagnosis and/or treatment of disease constitutes the practice of medicine. This being assumed as a premise, one may next inquire whether a hospital should, as a matter of ethics, or may, as a matter of law, practice a medical specialty? A corporation is a fictitious person, existing only in legal contemplation and, as such, cannot be licensed to practice a learned profession. The Supreme Court of Nebraska points out that "while a corporation is in some sense a person, —, yet it is not such a person as can be licensed to practice medicine."

But, it may be argued, the hospital is not practicing radiology; it is merely engaging a physician to do so. If the hospital does not profit by the professional activity of a physician so engaged, the argument may be tenable. But this is certainly not the case with those hospitals employing salaried radiologists and representing 30.9 per cent of the hospitals on which returns were had, and it is doubtful whether it is the case in the hospitals paying their radiologists by a division of the net proceeds, which represent about 30 per cent. If a hospital, or any corporation, hires a physician, accepts a patient for x-ray examination, and collects a fee, is it the hospital or its hired physician that is practicing radiology? A parallel question has been answered by the Supreme Court of Minnesota, in the case of *John Granger vs. Adson, et al.*, as individuals and as members of the State Board of Medical Examiners. In this case the court held that a layman could not conduct a health audit service, furnishing urinalyses and blood pressure tests, through the medium of employing a licensed physician to do the actual work, and it held that in so doing, the plaintiff in this

case was practicing medicine unlawfully. The court further held that the plaintiff's contract with his physician was illegal and in violation of the statute. In summing up the matter the court stated that "the law intends that the patient should be the patient of the licensed physician, and not of corporations or laymen."

Such activities of a hospital lead to further abuses. The physician, knowing that he is engaged in the practice of a learned profession, and bound by the code of ethics thereof, cannot cope with the type of competition offered by corporations not so bound. Comment on this aspect of the matter, such as the following, selected from widely separated places, was offered by numerous men:

"The hospitals compete with the private practitioner, and attempt to secure his private practice."

"Both hospitals compete with me in private practice, and I have no control over the fees charged." (The author of this comment serves both of the hospitals referred to, and therefore, of course, he is actually competing with himself.)

"Hospital receives non-hospitalized patients for x-ray examination, and for the sole purpose of adding income to the hospital. In other words, this tax-free institution, with equipment that has all been donated, is actively competing with me in my private practice."

"The hospitals here are slowly, but surely, taking most of our private practice, and we are doing the work for them."

As an especially apt illustration of the point in question, a man who is radiologist to a hospital with five hundred beds in a large city, writes: "The hospital insists that the members of the staff send all of their x-ray work to the hospital, ignoring Doctor — and myself. They make no effort to charge or collect more than the cost of the films, and the average fee for a gastro-intestinal examination is \$5. How can one expect or hope to conduct a private practice, and to do good scientific work in the face of such competition?"

One man sounds an ominous note of warning when he writes: "The same thing which has happened in radiology has happened in many localities in other fields of medicine."

CONCLUSIONS

We may now, perhaps, attempt to draw some conclusions from the replies received.

1. The great majority of radiologists have some sort of hospital service, and from it they derive a percentage of their professional income, varying from less than 5 to 100 per cent. The general average is 36.6 per cent.

2. The average radiologist reports that he is compensated by a percentage of the gross receipts of the department; but one need not be surprised to discover that there is considerable misapprehension of the meaning of "gross income," since many used such expressions as "gross after supplies," "gross after salaries," etc.

3. Except for university hospitals, almost none of the great hospitals of the country employ salaried radiologists, and very few of the nationally

known men replying are on a full-time basis. This, again, is excepting men with teaching positions.

4. There is an increasing tendency of the lesser hospitals to employ a salaried radiologist.

5. There is an increasing tendency of the hospital to regard the department of radiology as a source of income.

6. The majority of radiologists have no control over their departments.

Finally, we may inquire whether there is any workable and practical plan which will solve the difficulties we have discussed; that is, whether such plan or plans are in operation, and what comments were made by men working under such arrangements? There are plans of operation of hospital x-ray departments which are eminently satisfactory to both the hospital and the radiologist. The plan used by Doctors Groover, Christie, and Merritt is perhaps the best known, and is certainly a well-tryed one, being, in brief, this: The hospital provides and arranges adequate space, and installs equipment selected by the radiologist. The amount to be expended is agreed upon, and any amount above this figure is furnished by the radiologist. The radiologist agrees to furnish full-time service in the department, and accepts full control of and responsibility for the department. He undertakes to maintain the department, making all necessary replacements of, and additions to, the equipment, and to employ and pay all necessary assistants, and to furnish all supplies, etc. He agrees to do any reasonable amount of work for deserving poor patients without charge for his services, and for exceptionally poor patients without charge for either service or materials. The radiologist collects and retains all fees and pays the hospital an annual rental.

Of the three hundred and sixteen men replying, eighty-seven own the x-ray equipment of a hospital, and conduct their private practices in the hospital. In one instance the hospital and the radiologist own the equipment jointly. This plan is, of course, free from criticism, since it really amounts to a physician leasing office space from a hospital rather than from an office building.

How do such plans work out in practice? From a large hospital in a large city comes this reply: "Because of the high standards our department maintains, the trustees have felt satisfied with the arrangement despite the fact that the department is not a source of income. Of course a properly managed roentgen department indirectly increases the hospital income." From another large city is this comment: "This is the only way we would do hospital work. We bring a steady flow of therapy cases to the hospital, and much of the diagnostic work comes because of our connection"; and again: "The hospital is well satisfied, although the department produces no income for the hospital, because of the high standards maintained by the department of radiology."

BASIC PRINCIPLES

Apparently, then, it is possible to conduct a hospital department of radiology in a manner free from objectionable methods complained of, and

in a manner satisfactory to both the hospital and radiologist. To do so, requires only that all concerned recognize clearly:

1. That the practice of radiology is the practice of medicine.

2. That radiology is a medical specialty.

3. That hospitals and/or other corporations should not engage in the practice of medicine, and,

4. That radiologists should not enable hospitals to engage in the practice of medicine by becoming their salaried employees.

1930 Wilshire Boulevard.

DISCUSSION

HENRY SNURE, M. D. (1414 South Hope Street, Los Angeles).—At the request of Doctor Goin, I reviewed the questionnaires that were returned, and I believe that he has given an accurate and excellent résumé of the same. The majority (63 per cent) of those operating radiological departments in hospitals were on the percentage basis; the most unsatisfactory arrangements, of course, were those of the fifty radiologists who were paid a percentage of the net income, and due, perhaps, to the depression, some hospital business managers include items that do not properly belong under operating costs of the department. The statement was made many times that a percentage of the net arrangement is a slow but sure form of professional suicide. Another frequently repeated complaint was that any profit the hospital derived from the salary or percentage plan was diverted to the general fund to cover deficits in other departments, thereby allowing the radiological department to deteriorate. In other instances, hospitals did not live up to their agreements; one of these could hardly use the present depression as an excuse, for it agreed ten years ago to keep the department up to date in the matter of equipment, and yet had not purchased any new equipment during the ten-year period. Naturally, the department has much less income now than when it was first installed.

In other instances roentgenologists have installed equipment in hospitals and gradually built up the income of the department, only to have the hospital management demand a larger percentage. In one such instance, the roentgenologist was glad to sell his equipment and get out. This particular department is now being operated by his former technician, and no change in the rating of the hospital has been made by the College of Surgeons. Sometimes the radiologist has built up a good income for the department, and as a reward has been promptly discharged when someone else was found who would accept the position at a lesser percentage of the income.

There were several examples of the following: Fifteen to twenty years ago, departments were installed and, until recently, operated by the same radiologist; when he was discharged, and so-called business management applied to the department. Apparently, the result was the same in all cases: the various economies, such as cheap technical help, were applied, and promptly and markedly decreased the departmental income. Not only were the radiologist, patient, and referring physician dissatisfied, but also the hospital itself.

Occasionally, where the radiologist was frankly dissatisfied with his particular arrangement, he would suggest what he believed to be an ideal agreement; yet reports from other questionnaires would show that such an agreement had been tried and found wanting. As an example, a physician in the Southwest thought that it would be a good plan to have the hospital equip an x-ray department, pay technicians, and charge only for the technical service; the radiologist to put in a separate bill, the same as a surgeon would. Just about one hundred miles north of this physician's location such a plan was being tried, and was very unsatisfac-

tory. In this case the hospital collected for the technical charge, and the majority of the patients refused to pay any professional charge; having paid one radiological fee, they claimed that was enough, and apparently the hospital did not exert itself to explain or further collect from the patient. It seems difficult to convince the patient and others also that a cheap fee can only mean cheap service, and so in the end they get just what they pay for. Of the seventy-five roentgenologists doing work on a salary basis, very few are on full time after the number of teaching positions have been subtracted; the majority are receiving salaries for part-time work at government-owned or small hospitals. As Doctor Goin pointed out, the hospital employing a roentgenologist on a salary is really a corporation practicing medicine, and therefore, for the same reason, the roentgenologist should avoid making such an agreement.

In some of the larger hospitals the clinic or charity work was done without a professional charge in lieu of rent; again, others paid 10 per cent of the gross income as rental, when the equipment and technical cost was paid for by the radiologist. Under the heading of "Remarks," one reply states that previous to 1930 the percentage basis was satisfactory; but that the tremendous increase of free work, and the accompanying decrease in both number of cases and scale of fees from those able to pay, does not provide sufficient income to cover expenses.

Many of the radiologists believe that the radiological department should be equipped by the hospital and leased to them, perhaps on some form of gross percentage, something on the order of the Christie plan. Two of those replying stated that any type of percentage basis smacked of fee-splitting.

I believe that our national radiological societies should consult the College of Surgeons and the American Medical Association Council on Medical Education and Hospitals, with the idea of calling their attention to some of the questionable arrangements between hospitals and radiologists; these arrangements to be considered when the rating of the hospital is determined.

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L. H. GARLAND, M. D. (450 Sutter Street, San Francisco).—The author is to be congratulated on collecting and analyzing a large number of *facts* on a subject about which there has been much discussion, and concerning which many unfounded opinions have been expressed. The status of the radiologist in the hospital is, in general, not sound. What can be done to make it sound without at the same time interfering with the rights of the hospital in the matter? Doctor Goin suggests that one solution would be for the radiologist to rent space and major equipment from the hospital, reimbursing the latter monthly, and thereat conduct a practice of radiology. This would appear to be a simple, fair and practical method of solving the problem in many institutions.

What are the criticisms of this method? From the point of view of the profession, I doubt if there are any valid ones. From the point of view of the hospital superintendents, I have heard voiced the following criticisms, which I shall attempt to answer seriatim:

First criticism: "Hospitals, needing all the income they can get hold of in order to operate, would go into the red without the profits from the x-ray departments." The answer to this criticism is that the "rent" provided by the radiologist will supply the hospital with adequate income to prevent going into the red, as far as such can and should be prevented by any one division of the hospital alone. Parenthetically, it may be noted that the present basic ward bed charge of approximately \$3.50 per diem is hardly a true one; actually, the cost is probably much higher, the difference at the present time being made up from the profits from the x-ray and laboratory departments, and it seems unfair that patients who do not require such procedures as x-ray and laboratory work should

at present be receiving the benefits of them indirectly. That is to say, the profits made from patients requiring x-ray work, etc., are now applied to lowering the per diem bed charges of patients not needing such work. This could be gradually rectified under a rental arrangement.

Second criticism: "The radiologist is not practicing medicine and, therefore, is not entitled to an arrangement based on the assumption that radiology is the practice of medicine." This criticism is frequently made because of the fact that much, or all of the technical work of radiography is done by the technician, and because sometimes the radiologist merely sees the films and not the patient. This is a comprehensible criticism, if based on these grounds. However, it must be noted that the incentive to treat patients as individuals, to establish a close personal contact with them, is not encouraged in any form of salaried or other "hired type" of appointment. In those hospitals, wherein the radiologist is on a percentage basis, it will often be found that he is keenly interested in seeing the patients, and not infrequently radiographing them himself; that is to say, he practices medicine as he would in his own private office. However, just as the surgeon may have his nurse remove stitches or change a dressing, just as the internist may have his assistant inject some iron cacodylate or take a blood pressure, so will the radiologist have his technician take films of the chest or lumbar spine. Because the surgeon and the internist frequently delegate those technical matters to lay assistants is no ground for stating that they are not practicing medicine. Similarly, because the radiologist delegates much or all of his technical radiographic work to technicians, is no ground for stating *he* is not practicing medicine; his interpretation of the films and fluoroscopic examinations, and his consultations with the clinician seem to be very definitely the practice of medicine. In addition, most radiologists do therapeutic radiology; no one will gainsay that this constitutes practicing medicine.

Incidentally, it appears that, strictly speaking, the technical side of radiography cannot be undertaken as such by lay persons or a corporation. Since the taking of x-ray films involves a knowledge of anatomy and involves the application of a rather dangerous agent (the x-ray) to a portion of the human body, it would seem to be very definitely the practice of medicine, and therefore something that should only be done by a duly licensed physician and surgeon, or by a trained assistant under his close supervision and control.

Third criticism: "The radiologist has no right to have provided for himself a monopolistic practice." The practice of radiology in a hospital unquestionably tends to be somewhat monopolistic in nature. The reason for this is obvious: even granting that a hospital could legally furnish supplies and technical help, no department has ever yet been able to function satisfactorily without a permanent director in charge. If the department were run unsupervised and open to any radiologist or physician who chanced to come in and use it, the difficulty of securing safe, consistent and reliable records would be very great. By the very nature of the overhead involved it is, of course, impossible to have several x-ray departments in the same hospital. However, in most hospitals, if any attending clinician desires that one of his patients be examined by an outside competent radiologist, he can always secure such by merely requesting the resident radiologist to extend that courtesy. Hence, as far as that aspect is concerned, there is no essential monopoly. Lastly, the hospital does not actually provide the practice; the attending physicians, and the radiologist himself to a variable extent, provide that practice.

Fourth criticism: "The radiologist would make too large an income on a rental basis." The answer to this criticism involves the definition of what is too large an income. If by too large an income is meant one disproportionate with that received by the hospital, because of the fact that the rental paid does not

represent a fair and adequate one, then this criticism is sound. Again, if the fees charged by the radiologist are such that he is obviously capitalizing on his appointment, it is evident that his income can be too large. (In both these instances, the errors can be speedily corrected as outlined below.) If, however, by reason of his skill and professional competence the radiologist earns a large income, then the hospital can have no criticism to make; indeed, it is in a fortunate position, since by the very nature of the volume of x-ray work involved, the hospital will be the gainer both in room occupancy and otherwise. The conscientious radiologist of necessity employs a considerable number of well-trained and well-paid assistants, spends a considerable portion of his income on new diagnostic and therapeutic adjuncts, and is usually under a strong incentive to do much deserving clinic work. If, on the other hand, he is not conscientious, the executive staff of the hospital has the power to recommend the termination of his appointment.

I sincerely believe that some form of solution such as the above is a satisfactory one for the problem presented. The hospital does not relinquish control of the department, inasmuch as the rental contract can be annulled at any time (by either party) upon reasonable notice, and the personnel of the department and its general policies are subject to approval by the hospital. The rental plan would aid in establishing the status of the hospital fairly in medical practice, and quite as fairly in establishing the status of the radiologist in the hospital.

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CHARLES M. RICHARDS, M. D. (303 Medico-Dental Building, San Jose).—This survey which Doctor Goin has made for us is one of real value—which cannot always be said of reports on questionnaires. The chief basis of its value lies in the fact of the unprecedented response which it received and the widespread geographical distribution of that response. With an 85 per cent response from such widely separated parts of the country, no one can doubt the validity of the deductions drawn from this investigation.

It appears that only a small proportion of the leading radiologists of this country consider their own hospital relations ideal, and that a great deal of educating needs to be done if hospital executives and trustees are to realize the justice of the radiologist's claims. The abuses of the radiological department of hospitals have been going on for so many years that they have come to be taken as a matter of course. Hospital budgets have been set up, allowing for a profit from the x-ray and pathological departments to make up for some of the losses in the surgery, rooms, and wards. It has been considered quite a legitimate thing, and no one, until recently, has risen to expound the injustices of the practice. I am sure that we all believe that practically all the public-spirited laymen who give so much of their time freely, acting as directors and trustees of the hospitals of our country, would not knowingly work an injustice to any member of their professional staffs, though, in their enthusiasm to see their hospital get along, they have been parties to the exploitation of their radiologists and pathologists. I feel convinced that a great deal can be done by all of us in the education, along these lines in a quiet way, of our lay trustees, and the majority of them will eventually see our point of view and agree with us. Also the hospital executives, who are laden with the burden of running their hospitals with as little loss as possible, will be open to reason, and will eventually unlearn the lesson which has become firmly fixed in their minds, that the professional efforts of the radiologist and pathologist are legitimate sources of profit to the hospital. The American Hospital Association and the hospital section of the American Medical Association are showing a willingness to assist in this reeducating, and I believe that we shall soon be speaking to more receptive ears than we have in the past.

COMPULSORY HEALTH INSURANCE*

By FREDERICK L. HOFFMAN, LL. D.
Philadelphia, Pa.

IV

IN the background of all social insurance propaganda looms the spectacle of the economic distress of the medical profession. From practically every country come alarming reports of an oversupply of doctors, the growth in number being disproportionate to the growth in population. In the words of Dr. Alfred Cox of the British Medical Association, in an address on "A General Medical Service for the Nation," delivered last July before the Royal Sanitary Institute Congress at Blackpool, "all the resources of medical science should be available to every citizen of this country." To achieve this purpose, however, would stretch the resources of any country to the breaking point. Once more, in the words of Doctor Cox, "A scheme was wanted which would gather together all the various means, individual and institutional, for the promotion of health, and the cure and alleviation of diseases, and make them available to everybody." Such an idea, it may safely be asserted, is a hopeless dream.

RATIO OF DOCTORS TO POPULATION

The statement is frequently made that in the United States the ratio of doctors to population is much higher than elsewhere. In 1931, it was calculated that the ratio of doctors to population was one in 800, as compared with 884 for the British Isles, 900 for Austria, 1250 for Switzerland, 1560 for Germany, and 2860 for Sweden. Yet the death rate for Sweden in 1932 was only 11.6 per 1000, as compared with 11.2 for the United States, and 12.0 for England and Wales.

The "Social Dangers of an Oversupply of Physicians" are admirably presented by Dr. Walter L. Bierring of Des Moines, Iowa, in a paper read at the annual conference of Secretaries of Constituent State Medical Associations, September, 1933, and reported upon in the American Medical Association *Bulletin* of February, 1934. Doctor Bierring observes that "over a ten-year period the number of medical graduates greatly exceeded the number of deaths in the medical profession." And further: "According to the final report of the Commission on Medical Education, the United States has more physicians per unit of population than any other country in the world, twice as many as the leading countries of Europe. With a total of 156,440 licensed physicians in the United States at the present time, there is one for every 780 persons." He estimated that a reasonably complete medical care could be provided in this country on the basis of one physician to about 1,200 persons, and that an adequate medical service for the United States could probably be pro-

*One of a series of articles on compulsory health insurance, written for CALIFORNIA AND WESTERN MEDICINE by the well-known consulting statistician, Frederick L. Hoffman, LL.D. Articles in this series were printed in previous issues, as follows: I, in April, page 245; II, in May, page 361; III, in June, page 411.

vided by about 120,000 active physicians instead of 156,440. According to these figures, there is at present a surplus of approximately 35,000 physicians.

Bierring, therefore, estimated that if the present rate of supply is continued, the number of physicians in excess of indicated needs will increase, and he arrives at the conclusion that "by 1940 there will be in round numbers 171,700 physicians, and in 1980 about 211,800. The number of persons per physician in 1940 will be 760; in 1960 about 730, and in 1980 about 690. Even at the present time it is reported that in many urban communities there are two doctors for every call, and many can barely earn a decent living."

The English author of "This Panel Business" (already referred to in a previous paper) observes, in this connection, that "in 1931 the question of the alleged plethora of doctors was raised, and it was decided to issue a questionnaire to the various countries, and to put the subject down for discussion at their [the Association's] next annual conference." Dr. Alfred Cox of the British Medical Association reviewed the subject of overcrowding of the profession, stating that "This subject was reported on by Doctor Mattlet of Belgium, who based his report on the questionnaire issued early in 1932. This report disclosed a really terrible state of things in many countries—indeed, this country and Canada are the only two in which there is not at present, or threatened in the early future, a great surplus of supply of practitioners over the demand, particularly of 'specialists,' the number of medical students being positively alarming in many countries. Taking the period, 1900-30, the figures showed a constantly decreasing number of potential patients per doctor in every country, though there were still many rural areas which seem to be undersupplied with doctors. Doctor Mattlet examined the causes at some length, and showed that the consequences were a dangerous lowering of the morale of the profession. He declared that in some countries there was now a 'medical proletariat,' which was a menace to society, and this view was emphasized particularly from Germany, Austria, and Hungary."

INCOMES OF PHYSICIANS

According to a treatise on "The Way of Health Insurance" by Simons and Sinai (published by the University of Chicago Press in 1932), in Württemberg in 1928, 9.84 per cent of the insurance doctors received incomes of less than \$720; 15.15 per cent received incomes of from \$720 to \$1,440, and 23.72 per cent received from \$1,440 to \$2,400. In the state of Baden, Germany, in 1929, 16.45 per cent of the insurance doctors received incomes of less than \$1,000. When allowance is made for the difference in the cost of living, the situation in this country is not much different from that in Germany. According to the Julius Rosenwald Fund, there were 28,000 specialists in this country in 1929 whose incomes ex-

ceeded \$10,000 a year; 25,000 partial specialists with incomes of \$6,100; 142,000 practicing doctors with incomes of \$5,500; 68,000 general practitioners with incomes of \$3,900, and 25,000 general practitioners with incomes of less than \$2,000. These are net incomes of men who have paid substantial sums for their education, although in 1929 many of these had less than \$2,000 to live on. Of the doctor's gross income, 40 per cent is spent for professional expenses. In the aggregate, the Fund estimates that in private practice, in 1928, physicians were paid about \$1,100,000,000 in fees from their patients, but that only about \$660,000,000 of that sum was left to live on, because they had to spend \$440,000,000 for professional expenses, such as office rent, transportation, equipment, and assistants.

LURE OF PANEL INCOME TO YOUNG PHYSICIANS

Under conditions like these the young medical graduate is naturally eager for permanent employment, regardless of the compensation which, in most instances, is adequate to provide him with at least a minimum of subsistence. It is from this element that the panel in national health insurance is recruited to a considerable degree.

EXTENSION OF MEDICAL CARE FROM INDUSTRIAL WORKERS TO THEIR FAMILIES

The Committee on Medical Education (U.S.A.) made an illuminating report on the subject, with particular reference to Europe, published in April, 1930. In discussing sickness insurance, it was stated that "national sickness insurance has a very important influence on medical practice." It was the main object of social insurance, in early days, to provide cash benefits to persons incapable of working, instead of providing treatment. Everywhere the tendency is to bring in dependent members of the family subject to medical care on the part of the panel physician, which of course increases his responsibilities, but does not materially contribute to his increased earnings. In England, at the present time, 35 per cent of the total population is covered by national health insurance, or respectively 78 per cent of the occupied population, 86 per cent of the employed population, and 95 per cent of the employed population of insurable age. Medical benefit consists of a general practitioner service, but does not cover the services of a specialist, and is limited to the insured person only, not to his or her family. Aside from this, of course, children of school age receive a certain amount of general medical care from school physicians. Maternity benefits consist of a payment of forty shillings on the confinement of the wife of an insured man. If both the man and wife are insured, the maternity benefit is doubled. A woman who has received a maternity benefit is not entitled to a sickness or disablement benefit for a period of four weeks following her confinement. Sickness, disablement or maternity benefits are not payable to any person

who is a patient in a hospital supported by charity, by voluntary contributions, or by public funds. Sickness or disablement benefit is not payable for accidents or industrial diseases covered by the Workmen's Compensation Act. Out of these classifications arise no end of complexities which place a heavy burden of time and thought on the attending physician. The rules and regulations governing the system are numerous and burdensome.

SOME DANGERS AND DEFICIENCIES OF PANEL PRACTICE

In actual practice, it is true, the system has worked out better than was anticipated. The prosecutions for failure to conform to state requirements, or rules and regulations, are relatively few. On the other hand, the subserviency of the physician to the system hides many defects and deficiencies. The administration of the system by approved societies, to the extent of paying of benefits, makes the latter an impressive body with authority over physicians' activities. The latter being confronted by the duty of certifying sickness, most naturally adopt a course of easy acquiescence to avoid constant conflicts with the clients on his panel. The approved society is one of several bodies the doctor has to deal with, the national health insurance act having created about two hundred insurance committees in England, Scotland, and Wales to administer medical benefits with regard to certain features of local administration. These committees distribute the money sent by the Ministry of Health to the doctors in their areas in accordance with the number of persons on the list of each panel physician. The insurance collections are pooled for the entire country, and the pool is divided according to districts on the basis of the number of insured persons in each district. The amount assigned to each district, divided by the total number of insured persons in the area, sets the capitation fee, which has varied from time to time. The present capitation fee is nine shillings per insured person per year. But the compensation has been reduced to eight shillings for the time being and hope for restoration of the cut is very doubtful. According to the Supplement to the *British Medical Journal* of January 14, 1933, "The reduction of the capitation fee fifteen months ago, accepted by the Insurance Acts Committee, was met by insurance practitioners with a good deal of criticism in the correspondence columns of the Supplement in the last quarter of 1931. This criticism still continues."

The panel physician is no longer free or independent. He is for all practical purposes an employee of the state, and sooner or later there is a reasonable certainty that a state medical service will be established to replace the present highly involved and costly administration of national health insurance. But once such a system comes into operation, it is practically hopeless to anticipate a return to the earlier status of a free and independent medical service.

(To be continued)

THE LURE OF MEDICAL HISTORY*

PHYSICAL MEDICINE—SOME HISTORICAL FACTS AND FIGURES†

By HAROLD M. F. BEHNEMAN, M. D.
San Francisco

JUST as our own life began in the generations preceding this, so did modern medicine. As one candle is lit from another, each generation, each century of medicine progresses in the conquest of disease and the preservation of health.

If we pause briefly, in retrospect, we realize that physical medicine, which is constantly knocking at the door of modern therapy, is no youngster but a very wise old man. Let us review some old familiar names, and perhaps some that are strange to us; let us see some pictures long forgotten as they have hung in the corridors of time—pioneers, prophets and martyrs in a field of therapy whose origin was with Creation.

Progress in medicine, unlike that in other sciences, has rested upon the shoulders of a few strong men in each generation; the mass of men have been a detriment rather than an aid. We move ahead so furiously fast, we have been so necessarily engrossed in the maze of laboratory sciences since the discovery of bacterial etiology of disease, that we are very apt to underestimate and discard our age-old methods of treatment, and so easily lose our memory of those pillars in the foundation of rational medicine. To the student of medical history this will be but a review; to a busy practitioner, I hope it may bring at least a glimpse of the history back of the oldest form of treatment known to man.

USE OF HEAT AND LIGHT

Ancient inscriptions of all sorts indicate that folkways of early medicine, regardless of their origin, have been the same. The use of heat dates back to remote antiquity. Even animals lie in the sun when ill. Massage was long known and practiced by the Indians, Chinese, Japanese, Hindus, and Malays; the manuscript, "Kong Fao" (3000 B. C.) contains accounts of various methods used. The Indian used the hot spring, the vapor bath, and cold plunge. The Ganges and the Nile are frequently referred to in history as the bathing places of ancient man. The Persians, Egyptians, and Phoenicians knew of massage, which was probably imported into Melanesia by Polynesian castaways, as their massage was truly rational and effective. The Indian's "Turkish" bath was the geyser, the warm spring and the sweat-oven. Let us consider these various forms of physical medicine separately; first, that of heliotherapy.

*A Twenty-Five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellany Department of CALIFORNIA AND WESTERN MEDICINE, and its page number will be found on the front cover index.

†From the department of medicine, University of California.

‡Presented at the American Congress of Physical Therapy, New York, September 5, 1932.

In Heliopolis, the Egyptian city of the sun, there were temples which served as centers of medical activity. Between 3000 and 1000 B. C. a distinctive culture was carried, by navigation and trade, from Egypt to the Mediterranean; and after the latter date by Phoenicians to India, to Melanesia, and to America. This culture had as its foundation the worship of the sun. Aesculapius, the son of Apollo and the god of medicine, became an immortal object of worship. The temples of his cult were like the health resorts of modern times.

Asclepiades depended upon light in conjunction with baths. Hippocrates was the first physician to use sun treatment. The Incas of Peru erected elaborate temples to the sun, which also held a superior place in the theocratical college of Ancient Egypt. The ancient Persians venerated the orb of day. Pliny said: "The sun is the greatest curative agent." The ancient Greeks exposed their ailing to its rays: Hippocrates, Celsus, and Galen supported its use. Aristotle said that the sun produced the green of vegetable matter. The Greeks worshiped Helios and Apollo, the Egyptians their Ra, the Israelites and Philistines their Baal, the Persians their Mithra, and the Germans their eye of Wotan. All through primitive and ancient medicine, we find papyri, manuscripts and friezes, as well as various other forms of art depicting the use or worship of the sun. Later on, the most celebrated Arabian physician, Avicenna (980-1037) recommended sun baths. John of Gaddesden (1280-1361) first used light about 1307, in the treatment of smallpox. Walter Harris in 1742 noted that clam shells, when ground up in the sun and used in treatment, cured or improved certain diseases we know now as lacking in calcium metabolism. Thus, two hundred years ago began the use of irradiated foods. Early in the nineteenth century, Ollier and Poncet wrote on the sun treatment of tubercular arthritis. In 1676, Roemer (1644-1710) discovered the velocity of light. In 1777 Karl Wilhelm Scheele (1742-1786) discovered rays which darkened silver chlorid. The German physician, Christopher Wilhelm Hufeland (1762-1836) recommended sunlight in scrofula. In 1801, Ritter discovered the ultra-violet rays. In the same year Sir Humphrey Davy (1778-1829) demonstrated the first carbon arc light. Isaac Newton (1642-1727) in 1666, by prisms, pointed out the various divisions of the visible spectrum. Theobald Palm in the late eighties spoke of rickets as "the shadow disease." Loebel, in 1815, designed a sun-bath cabinet. In 1857, Jean Martin Charcot (1825-1893) stated that sunburn was due to invisible rays of the sun, and in 1885 Unna proved them to be such. In 1814, J. von Fraunhofer (1787-1826) discovered the dark lines of the spectrum. William Herschel (1738-1822) revealed the infra-red rays. In 1897, Finsen (1860-1904) established his light institution. For the treatment of scrofula, Lugol (1788-1851) considered light essential. This was before the tubercular etiology was known. I can only mention famous characters in this early history

such as Thomas Beddoes (1760-1808), Johann Wolfgang Dobereiner (1780-1849), and Bonnet (1802-1858). In 1889, Widmark proved ultra-violet rays caused erythema and pigmentation. Finsen was the first to establish, let alone to suggest, that all rays of the sun were not equally of value in treatment; he was certain that the ultra-violet rays were the most effective. In 1895, he started using sunlight for the treatment of lupus; he invented and constructed the first water-cooled ultra-violet machine thirty-seven years ago. Bie, with Finsen, showed that the bacteriological properties of light lay in the blue and ultra-violet rays. Finsen was the originator of artificial light in therapy, using the carbon arc and receiving the Nobel prize. Forty years before, however, one Arnold Rickli of Austria established a clinic and used the sunbath for treatment. In the eighteenth century, Hewitt patented a lamp with a mercury vapor arc, after Arons in 1892 had developed and evaluated the same type of lamp with the mercury arc through a vacuum. The open-air treatment of disease existed in Scotland in 1747. There was a seashore hospital at Margate in 1791. George Bodington (1799-1882) in 1840 anticipated modern views in the use of cold dry air in lung diseases. The first open-air sanitarium for tubercular patients was established in Walden-burg mountains by Brehmer in 1859. It still exists. Our own Trudeau was a pioneer in this field in this country, and Bernhard and Rollier in Switzerland. So much for the sun, "the Giver of Life."

HYDROTHERAPY, MASSAGE, AND EXERCISE

Turning now to hydrotherapy, massage, and exercise, we are confronted with volumes of historical knowledge and use. Hydrotherapy probably began with the licking of wounds by animals. In ancient records we find that the Hebrews attained the highest eminence among oriental peoples in hygiene and hydrotherapy; they may be said to have originated public hygiene. In the medieval medicine of Japan, when disease was said to be caused by divine influence or devils, there were two deities who presided over healing, and one of their chief forms of therapy was mineral baths. Massage was so predominant and useful that it was considered the duty of the blind to learn it as an occupation. A thousand years before Christ, medical men, quite apart from the priests, practiced gymnastics, bathing and anointing. Osler has said that Greek medicine had a triple relationship with science, gymnastics, and theology. Hydrotherapy was so successful that Thales of Miletus (639-546 B. C.) taught that water is the primary element from which all else is derived. Hippocrates, as we know, felt that open air, massage, and hydrotherapy were foundations of treatment. Asclepiades depended upon light, hydrotherapy, and massage. He introduced general water therapy, and no less than eighteen hundred public baths had been founded during the period 334 B. C. to 180 A. D. The baths of Caracalla and Diocletian had marvelous accommodations for 1600 to 3,000 persons. In realizing

as much as that of the barber-surgeons. The fact that the Roman baths existed over two thousand years ago, we must pay tribute to their remarkable achievement and architecture. There were hot rooms, warm rooms, exercise rooms, swimming tanks, and a cold room actually called then the "Frigidarium." The large baths admitted plenty of light and air to the bathing rooms. The Romans knew enough of the value of sunlight to have the bathing rooms built with one whole side or the roof capable of being opened. Profuse perspiration was induced in the hot rooms. Bathing, exercise, and massage was a part of the Roman's daily routine. Even in the farmhouses the air or sunroom (atrium) was retained.

You have heard of the famous ship of Aesculapius, built by Romans about 293 B. C. in the middle of the Tiber, where they fled during a pestilence. There a great temple was erected to their God of Medicine, and this now forms one of the most interesting ruins of Rome. The island was cut in the form of a huge ship, 900 feet long and 240 feet wide, perfect in every detail, even to a huge mast. There was a central temple, with smaller ones around it, where medicinal baths, massage, and exercise could be applied. Springs were so venerated in their efficacy that they were considered as holy. Vitruvius in 46 B. C. wrote some remarkable medical treatises.

In the medieval period the general practice of surgery was still in the hands of the bathkeepers, ablest Italian surgeon of the thirteenth century, Saliceto (1210-1277), specified wet compresses in skull injuries to prevent the admission of foul air. The early medical schools of Salerno and Montpellier had enormous bathing departments. In 1872, Mercuriali (1530-1606) wrote a famous treatise on medical gymnastics, which was illustrated. Homer refers to warm baths for fatigue and injuries. The first ancient public baths were probably established by the Lacedaemonians, who were given the credit of having invented the hot air bath. Hippocrates attached great importance to water therapy, and in 460 B. C. employed it with friction and rubbing for the treatment of muscle spasm and disease of the joints. He recommended physical therapy in gout, pneumonia and rheumatism. Galen gave first place to water in the treatment of disease. The Romans practiced bathing in the Tiber after exercise, and their emperors vied with one another in constructing gymnasia and baths, known as "thermae." The chief ones were at Agrippa 21 B. C., Nero 65, Titus 81, Domitian 95, Commodus 185, Caracalla 217, Diocletian 302 A. D., and Constantine. The Ganges and the Nile are frequently referred to as the bathing places of ancient men. The bathing establishments of the Persians were handsomely equipped. In 525 A. D., Alexander of Tralles recommended the use of water. In 923, Rhazes and in 1036, Avicenna, two Arabian physicians, advocated the use of cold water in fevers and diarrhea. The Japanese used it in the treatment of mania, convulsions, and hysteria. In 1576, Paracelsus wrote on mineral baths. In 1555, Cardano wrote on the uses of water. In England in

1696 and 1702, Sir John Floyer and Dr. Baynard wrote "The History of Cold Bathing." It ran through six editions and was translated into German. In 1723, Niccolo Lanzini published "Right Methods of Using Cold Water in Fevers." In 1738, Hahn wrote "The Power and Effect of Cold Water," and the Hahn family were all prominent in this field. In 1753, V. Perez published a work on hydrotherapy. In 1761, F. Hoffman of England published an article on "The Nature and Properties of Water." In 1776, Wright published in the *London Medical Journal* his experiments with cold water and fevers. In 1829, in Grafenburg, the celebrated Priessnitz established a cold water cure, so successfully that the Austrian Government lent its patronage. In 1874, Schuller published his observations of thermic applications on the circulation. In 1892, Vinaj confirmed these observations; they laid the foundations for our present knowledge of the effects of cutaneous thermic applications upon the visceral circulation. In 1848, Fleury of France published his work describing the invention and use of the douche. In 1760, Tissot (1728-1797) recommended the cold bath in fever. In 1861, Brand of Stettin published the amazing results of his bath in the treatment of typhoid fever. The late Doctor Winternitz (1835-1917) of Vienna was probably the father of rational physical therapy and wrote on the central nervous and circulatory systems. In 1897, Doctor Currie published his findings in the use of water in fevers, and of salt water in typhoid. In 1804, Oertel advised water drinking, and with Priessnitz popularized hydrotherapy. In 1860, Jurgensen of Kiel stressed this important form of therapy. In 1870, Liebermeister employed cold water in typhoid, with striking results. The Bavarian pastor, Kneipp, furthered greatly rational hydrotherapy. The first in this country to do much in that field was Russell Trall (1844). Ernest Brand (1827-1897) used cold water in typhoid, and in the nineties the great Winternitz created a school of clinical hydrotherapy. All this was many years after Homer spoke of Penelope's use of the bath to allay the melancholy of her husband's absence, when Hercules was refreshed by Minerva at the springs of Thermopylae, when Ulysses advised his father to have warm baths in his old age, and Oribasius developed the theory of hydrotherapy. Let us not forget Plato and his use of water in various diseases, and also Aretaeus, who applied sulphur baths in skin lesions and was the first to advise keeping the head out of the steam bath. And last but not least, Galen, Celsus and Paulus of Aegina, who used baths in fevers and the Spartans who bathed by law. The history of Japanese medicine reveals their use for nearly a thousand years, and Nakagami published a treatise on the subject over three hundred years ago.

Attempts were made with the insane even in the eighteenth century in the field of hydrotherapy. Many such affected were sent to the mineral baths in Meyenberg and Pyrmont. In Germany, the barber was often a bath keeper (balnearior); and perhaps no other country has been so famous for

her resorts of hydrotherapy even in modern times. In our own country it is interesting to note that Samuel Thomson (1769-1843) of New Hampshire, received a patent on January 23, 1823, on the use of steam to produce perspiration. In 1801, Dr. James Thacher of Plymouth wrote that massage and hydrotherapy were too much neglected. Oliver Wendell Holmes, surgeon and poet, lauded physical therapy in 1859, as did Doctor Garratt of Boston in 1867.

In the brief consideration of massage and exercise, our earliest record again is the ancient Chinese "Kong Fao," wherein the Chinese employed rubbing as a therapy measure. Aesculapius might be called the inventor of it, in disease. Herodikus in 500 B. C. used it systematically. Massage in German medicine was so valuable that shepherds, herdsmen, and smiths became renowned as masseurs. Metzger of Wiesbaden originally rated massage as a branch of therapy, using the stroking, rubbing, kneading and beating, and instituting the first intelligent and methodical use of massage. In the sixteenth century, Fabricius used physical therapy in stiff joints, and today we recognize this as essential in personal and public hygiene, as well as in preventive medicine.

EXERCISE

In the consideration of exercise or gymnastics, our first knowledge is of Herodikus of Selymbria (about 500 B. C.), who was the father of exercise and mechanotherapy. Hippocrates was also its advocate. Erasistratus (300-225 B. C.) wrote on gymnastics. He was followed by Asclepiades (about 100 B. C.), by Celsus, Thessalus (60 A. D.), Galen (130-200), Antyllus (550) Paul of Aegina (625-690), Rhazes (860-932), and Avicenna (980-1037), all of whom lived before the tenth century and wrote extensively on the value of gymnastics.

In 1569, Geronima Mercurialis wrote "De Arte Gymnastica," the best known work in the gymnastics of the ancients. He was followed by Timothy Bright, then by Thomas Sydenham (1624-1689), who wrote of the virtues of exercise. The father of our present rocking-horse was Quellmaltz (1735). A vibrating chair was used by Voltaire, while Chirac rode in a carriage on cobblestones. In 1704, Tissot published his "Gymnastic Medicinale." The first orthopedic book was published by Nicholas Andry (1741). In 1704, Hoffman wrote that exercise was the best medicine for the body. The teachings of John Hunter form the basis of our present methods of muscle training. Peter Henrik Ling (1776-1839) put exercise and massage on a scientific basis, but Jacques Matthieu Delpech was the first to use gymnastics to treat human deformities. John Shaw (1792-1828) introduced athletic exercises into surgery, and Zander (1857) devised the machine therapy for muscle groups.

HEAT

The subject of heat has, of course, been covered mostly in our discussions of exposure to the sun, the warmth of baths and of steam; but I must

make mention of the interesting use of colored light, particularly red. The ancient Japanese used red hangings to reflect red light and its heat upon smallpox patients. In the light of modern science we know that an increase of blood supply to the skin by infra-red heat means increased drainage. This, in turn, does much to lessen the inflammation present in the pustules of smallpox and might well lessen the scars. The red light used by Finsen to prevent pitting in smallpox, therefore, was just the continuance of ancient folklore. Anglicus, Bernard, De Gordon, and John of Gadsden had employed it successfully in the case of the son of Edward the Second of England. Edward the First was treated thus, being covered with scarlet blankets and red counterpane. In the reign of Queen Elizabeth, red curtains and red glasses about smallpox patients were prevalent. Children were clothed with scarlet curtains in the eighteenth century in France and Japan. An old Roumanian custom from time immemorial has been to cover smallpox patients with red cloths. In Tonkin, the patient was placed in an alcove. Svendsen proved that light could change a vesicle of smallpox into a pustule.

The advocates of dry heat were few in comparison to the advocates of moist heat. In 1840, Guyot published a treatise on hot air and heat for pain. In 1844, Chautard published an article on the use of dry heat in rheumatism, and in 1893, Tellerman on the use of dry heat in pain. Now when we mention the cautery, we think of electricity; but not so in the olden days, when it was burning by a hot iron. Early use was made of this means by Avicenna (980-1037), the celebrated Arabian already mentioned, physician-in-chief to the hospital of Bagdad who, in his "Canon Medicinæ," insisted upon the substitution of the cautery for the knife. Albucasis of Cordova, another Arabian physician, flourished in the eleventh century and was the author of a notable résumé called the "Al-Tasrif." One whole volume deals with the use of the actual cautery, the special feature of Arabian surgery, and gives descriptions and figurations of the peculiar instruments used. In Germany, Brunschwig, in 1497, used the actual cautery to check hemorrhage in amputations. The name of the French surgeon, Ambroise Paré (1517-1590), is already familiar for his famous statement that "diseases not curable by irons are curable by fire," and his use of the cautery on the battlefield is well known. It is interesting to note, too, that he also introduced massage into orthopedic surgery. Guy de Chaliac (1300-1368) employed the actual cautery in the fungus variety or lesions, as well as in caries, anthrax, and others.

ELECTRICITY

And so the history of modern medicine evolves merely into the history of man, bringing us, last of all, to speak of electricity. You were probably aware of the early history of the subjects I have mentioned, but perhaps there is not in your minds a true realization of the age of electricity and its use upon humans. Probably the first realization of

electricity came in the use of the amber bead as a clutcher on the spindle of Phoenician women: the very term, you know, comes from the Greek "elektron," the word for amber. Centuries ago the women of Africa bathed their sick children in waters frequented by the electric eel and torpedo, and in the reign of Tiberius electricity was employed by Scribonius Largus in the treatment of gout and headache by means of the torpedo fish. Pliny and Dioscorides refer to the remedial powers of electricity. In 1772, John Walsh described electricity in the cartilaginous torpedo. About 600 B. C., Thales of Greece, chief of the seven sages, rubbed a piece of fossil resin and observed that the amber attracted bits of cloth and feathers. In the time of Emperor Tiberius a freedman stepped on a torpedo fish and was freed of gout; this treatment was then recommended by Dioscorides for headache, as well as by Galen and Paul of Aegina (625-690). Aetius (450) employed a magnet for gout, and Paracelsus (1493-1541) maintained that magnets had powers of therapy. William Gilbert (1540-1603) published in 1600, "De Magnete," and Gilbert, a physician to Queen Elizabeth, can be called the father of clinical electricity; but Krueger (1715-1759) first used it as a curative agent in 1744. In 1621, Van Helmont (1557-1624) published "De Magnetica." In 1660, Von Guericke (1602-1686) constructed the first primitive static machine, and in 1709 Hanksbee improved it. Our own Benjamin Franklin (1706-1790) in 1749 established the electrical origin of lightning and used Leyden jars in the treatment of disease; while in 1753 Richman was killed repeating the kite experiment. In 1745, Krantzenstein (1723-1795) first used Leyden jars in Europe in treating disease, curing within a quarter of an hour a woman with a contracted finger. Jallabert was the first to produce muscle contraction by sparks (1712-1768), and in 1792 the famed Luigi Galvani (1737-1798) of Bologna discovered the electrical property of excised tissues of the frog, which was the starting point of modern work.

Following him, with great insight, was Alessandro Volta (1745-1827), professor at Pavia. His "Letters on Animal Electricity" gave us our first conception of electrolysis and the demonstration of tetanic contraction by successive electric stimulæ. The static spark was first used in 1734, by Abbé Nollett.

The first static machine in London was installed in the Middlesex Hospital in 1767, St. Bartholomew's in 1777, and St. Thomas' in 1799; and an old print of that date hangs in St. Bartholomew's electrical department now, showing the administration of static electricity to a patient. Doctor Bird in 1836 became the first head of a hospital electrical department in England. The famous Purkinje (1787-1869) was a pioneer in galvanic stimulation. The German physiologist, E. H. Weber (1795-1878), discovered the action of the vagus nerve by electromagnetic currents. His brother, W. E. Weber (1804-1891), constructed one of the first electromagnetic telegraphs and used electricity in muscle movement. The famous

religious reformer, John Wesley (1703-1791), in the 1760 edition of his book, "The Desideratum," on the treatment of disease, introduced electricity and stated: "It comes nearest a universal medicine of any yet known to the world." Thomas Addison (1793-1860) was the first to employ, in 1837, static electricity in the treatment of spasmodic and convulsive disease. In 1825, direct current was used in Europe. Our own S. Wier Mitchell used faradic current in striated muscle.

Michael Faraday (1791-1867), English physicist and chemist, wrote 158 scientific papers and one textbook, and his discoveries in electricity were many, particularly in magnetic induction. In 1767, the English clergyman and natural philosopher, Joseph Priestley (1733-1804) published his "History of Electricity." In 1773, the British surgeon, John Hunter (1728-1793) made known his observations on the torpedo; in 1793, Volta designed the first battery. In 1783, Marat put out a book on electricity and therapy. In 1825, Georg Simon Ohm (1787-1854) propounded his "Ohm's Law," and in 1841, Jonle (1818-1889) published his studies on electrolysis. In 1842, Reymond (1818-1896) became the founder of modern electrophysiology: he introduced, in 1849, faradic stimulation from a special induction coil, and was the first to describe and define electrotetanus—a truly great man.

In 1855, Duchesne (1806-1875) classified electrophysiology. He was the founder of electrotherapy and he employed induced current in the treatment of paralysis. Remak (1815-1865) substituted galvanic for the faradic current, and in 1855 demonstrated points of muscle stimulation on the human. Von Ziemssen (1829-1902) charted these motor points in 1857. Althouse (1831-1900) of London, in 1867 published the first systematic work on electrolysis; and in 1866 he removed a nevus. Michel, in 1875, removed hair by this method. In 1891, Tesla first suggested diathermy use, and in 1892 D'Arsonval introduced high-frequency currents, describing their action, while in 1893 Oudin demonstrated fulguration.

Carlo Matteucci (1811-1868) introduced the word "tetanize" in 1838, and first demonstrated that the muscle of a muscle-nerve preparation will contract if its nerve be laid across another contracting muscle. Adolf Fick (1829-1901) wrote two important works on medical physics and invented several new instruments. Hugo Kronecker (1839-1914), as long ago as 1871, distinguished himself for his physiology of muscle work with the use of electricity.

Erb suggested the method of electrodiagnosis by galvanic and induction currents, and followed Duchesne in the extensive development of electrotherapy. S. Wier Mitchell, one of the greatest neurologists of his time, introduced the use of electricity in the treatment of nervous disorders, combining it with rest, massage, and fresh air. Nicola Tesla first suggested the medical use of that form of electricity now known as high-frequency; Nagleschmidt gave it the name "diathermy," and Doyen first used it in surgery.

384 Post Street.

CLINICAL NOTES AND CASE REPORTS

OBSTRUCTION OF THE SUPERIOR VENA CAVA —BY CARCINOMA OF THE BRONCHUS

By W. E. DIEFENBACH, M. D.

La Jolla

AND

R. H. SUNDBERG, M. D.

San Diego

INSTANCES of obstruction of the superior vena cava by primary carcinoma of the bronchus are not unknown. The infrequency of their occurrence, however, and the fact that the roentgen findings entirely masked the true nature of the disease, make the case to be reported worthy of record.

In most cases of carcinoma of the bronchus reported, the lesion has been situated below the hilus area in the main bronchus of the right lung. Involvement of the left main bronchus, and of the bronchi of the upper lobes, have also occurred frequently. Primary carcinoma, with substernal involvement of either right or left bronchus sufficiently massive to occlude the superior vena cava, is not common. In 1922 Dana and McIntosh gave a comprehensive review of all the literature on the subject of interference of circulation of the superior vena cava by primary carcinoma. They found twenty-three reports of obliteration of the superior vena cava by primary carcinoma of the lung, only six of which were verified as carcinoma,

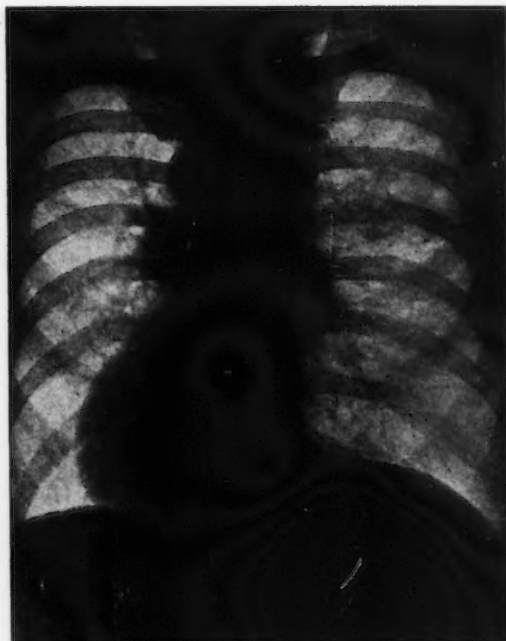


Fig. 1.—Film showing findings characteristic of all films taken during the two and one-half years preceding and up to five days before death. Left apical fibrosis, marked emphysema of right upper lobe with linear fibrosis of right middle lobe.

and fourteen reports of obliteration by primary carcinoma of the bronchus. In 1930, Brown reviewed the literature on this subject and added



Fig. 2



Fig. 3

Fig. 2.—Anterior view of right lung and heart. An applicator was forced through the obstructed lumen of the superior vena cava and is shown in position. Portions of the emphysematous areas of the right upper lung were torn because of adherence to the parietal pleura.

Fig. 3.—Posterior view of right lung and heart after removal from chest. T, trachea above bifurcation. CA, site of removal of section shown in figures 4 and 5. RB, right main bronchus partly occluded by new growth. LB, left main bronchus approximately normal in size.



Fig. 4.—Sclerosing carcinoma surrounding vena cava.



Fig. 5.—Carcinoma of right bronchus, showing attempt at alveolar formation.

one case of peribronchial carcinoma of the right upper lobe, which occluded the superior vena cava; making a total of thirty-eight reported cases. The following case report brings this total up to thirty-nine.

REPORT OF CASE

The patient was a man, forty-two years of age, who gave the following history. In 1925, following an acute attack of gall-bladder colic, a gangrenous gall-bladder filled with stones was removed. In January, 1931, he complained of stomach pain, dyspnea and cough, and a diagnosis of duodenal ulcer, confirmed by roentgen study, was made. The stomach pain was relieved by diet, but the cough and dyspnea, which were ascribed to a chronic bronchitis and bronchiectasis, did not lessen. In February, 1932, he complained of swelling of the face and neck, pain in the right side of the chest with inspiration, and dyspnea. At this time the temperature was 98.6, and the pulse 108. The veins of the right side of the neck were dilated, and the patient coughed continually. He did not stop work, however, and even won a golf club championship. In March of that year a tonsillectomy was performed, with no resultant improvement. In April, both arms and the chest wall became edematous, and the symptoms increased in severity. In May paralysis of the left vocal cord, with hoarseness, developed. By the middle of May the right axillary veins had become prominent, and subsequently the upper abdominal and inguinal veins on the right side became engorged. At this time the patient began to raise blood-streaked sputum, and bronchoscopic examination was advised but refused. Anorexia developed, together with marked dizziness and giddiness on stooping, or even with exertion. One dose of deep x-ray therapy over the superior mediastinum resulted in an increase of all symptoms.

The patient was first seen by us in the early part of December, 1932. His condition had improved somewhat with rest during the preceding two months, but he was complaining at that time of nausea, vomiting, anorexia and blood-tinged sputum, right mid-chest pain, dyspnea, and hoarseness. Physical examination

revealed paralysis of the left vocal cord; increased sounds at the right apex of the chest, but no typical râles; edema of the supraclavicular area; and marked collateral circulation over the entire chest and abdomen down to the inguinal region.

Roentgen examination of the chest showed marked emphysema of the right upper lobe, with evidence of a linear fibrosis along the interlobar septum of the inner upper right lobe. (See Fig. 1.)

All symptoms increased in severity during the month following our first examination, especially those referable to the stomach. Because of these gastric symptoms, a partial obstruction of the duodenum was suspected; but roentgen examination of the gastrointestinal tract showed no evidence of it. Analysis of the gastric contents revealed the absence of free hydrochloric acid. Bronchoscopic examination was again advised, but refused. During the first week of January, marked congestion of the right mid-chest developed, with raising of considerable sputum, one specimen of which was reported as positive for acid-fast bacilli.

Because of the duration of symptoms over a period of two years, the pleurisy which accompanied their onset, the evidence of fibrosis in the left apex, the presence of acid-fast bacilli in the sputum and the increase of symptoms under roentgen therapy, we felt that we were dealing with an inflammatory lesion, probably a tuberculous mediastinitis, with obliteration of the superior vena cava and obstructive emphysema of the right upper lobe of the lung.

The patient died on January 12, 1933. Clinical and roentgen evidence of death was massive consolidation of the right middle lobe, in the region of the previous fibrosis. Postmortem examination revealed a carcinoma of the trachea. The lesion was located at the bifurcation of the trachea, and extended into the right bronchus and into the right hilus area, occluding the superior vena cava.

Postmortem Findings.—The report of the postmortem examination, performed by Dr. H. S. Sumerlin, was as follows:

"External examination showed numerous dilated veins in the skin over the thorax and abdomen; one

on either side extended down to the external inguinal ring. There was a palpable lymph node in both axillae.

"The heart and lungs were removed *en bloc*.

"The right pleural cavity contained more than a liter of clear yellowish fluid with masses of jelly-like fibrin. The right upper lobe was firmly adherent to the parietal pleura, and the left lung was adherent on all surfaces. The posterior mediastinum and right hilus areas were involved with a growth of very firm white tissue. The superior vena cava was completely occluded by pressure of the surrounding growth, which was about one centimeter thick at this point. The lumen of the vena cava was apparently not invaded. There was ulceration of the mucosa at the bifurcation of the trachea and extending down into the right bronchus. At this point the trachea and bronchi were surrounded by the growth, and at the bifurcation there was a mass three centimeters in thickness which was continuous with the wall of the right bronchus. The lumen of the right bronchus was about half the diameter of the left.

"The upper half of the right upper lobe was the site of an extensive multilocular emphysematous cavity. The lower portion of the lung was compressed, contained little air, and was bronchiectatic. Many of the dilated bronchi were filled with purulent material. The consistency of the lung was that of a chronic interstitial pneumonitis. The left lung showed no changes. The heart was normal except for a mural thrombus in the right auricle. The aorta showed moderate sclerotic changes.

"The organs of the abdomen and pelvis showed no gross pathology.

"Microscopic examination: The section from the white fibrous tissue showed sclerosing carcinoma. In the trachea and bronchus the growth was most marked in the submucosa and, except for a few areas of ulceration, was covered by intact mucous lining. The majority of the cells were large, vesicular and undifferentiated, but a few areas were seen in which there was definite attempt at alveolar formation. This strongly suggests origin from the mucous glands. The lumen of the vena cava was not penetrated. The right lung showed bronchopneumonia, chronic bronchitis, and fibrosis.

"Pathological diagnosis: Primary sclerosing mucous gland carcinoma at the bifurcation of the trachea and in the right bronchus, occluding the superior vena cava and extending into the right hilus area; serofibrinous pleurisy; emphysema; bronchiectasis; bronchopneumonia; chronic interstitial pneumonitis of right lung; establishment of collateral circulation by the veins of the skin and deeper tissues of the thorax and abdomen."

COMMENT

The point of special interest in the case reported is, as stated earlier in the paper, the complete lack of evidence on the x-ray films of the true nature of the disease. Roentgen examination of the chest was made at regular intervals throughout the two years of the patient's illness. All films showed progressive emphysema of the right upper lobe, and fibrosis of the middle lobe on the same side. No infiltration or mass, suggestive of tumor tissue, was evident at any time. The emphysema was probably interpreted as obstructive in type, and the fibrosis was considered inflammatory, possibly bronchiectatic in origin. The condition producing the constriction of the vena cava, and the secondary changes in the lung, was considered tuberculous in character because of the pleurisy accompanying its onset and the acid-fast bacilli found in the sputum on one occasion. However, no active tuberculous lesion was found at autopsy.

We believe that a bronchoscopic examination would have revealed the presence of the new

growth, and that had the patient permitted this procedure the correct diagnosis could have been made at least one year before death occurred.

IN CONCLUSION

A case of carcinoma of the bronchus obstructing the superior vena cava, in which the true condition was not discovered before death, is reported. Repeated x-ray films of the chest throughout the course of the illness failed to reveal any evidence of new growth.

2001 Fourth Avenue.

LYMPHOGRANULOMA INGUINALE

By H. J. TEMPLETON, M. D.

Oakland

AND

DUDLEY SMITH, M. D.

San Francisco

LYMPHOGRANULOMA INGUINALE, also known as Nicholas-Favre disease, or as the "fourth venereal disease," is a specific entity which was formerly thought to be limited to the tropics. In recent years many cases have been reported from Europe, and very recently a number in the United States, especially by Wolf of Cleveland, Ohio.

It is not the purpose of this paper to repeat the excellent clinical descriptions which can be found in Wolf's articles. However, we would like to briefly review them. The disease is essentially venereal, being acquired by intercourse with an infected partner. About one or two weeks after exposure, a small, fleeting sore develops on the genitalia. This is often so insignificant as to escape attention. Four to six weeks after the exposure the glands draining the area primarily inoculated become involved. They swell, become painful, suppurate and break down. From this point on they usually persist for months or even years as discharging sinuses. When the inguinal glands are involved, as is usually the case in males, the picture is similar to the broken-down discharging glands of a chancroidal infection. In women, two somewhat different and rather characteristic pictures are seen. The one consists of hard edematous hypertrophy of the labia, often with ulceration and sinus formation. This is due to lymphatic blockage caused by destruction of the inguinal glands (or to retrograde infection?) and is probably the same condition which was formerly known as esthiomene. The other syndrome occurs when the primary infection appears in portions of the female genital tract which drain into the anorectal lymphatics. In these cases, anorectal fibrosis, strictures, ulcerations, and draining sinuses are seen. This condition is probably analogous to that which was formerly erroneously known as "anorectal syphiloma of Fournier."

The causative organism has not been isolated, but the disease has been reproduced by inoculation. The pathology, as seen in a gland which has not completely broken down, is rather characteristic—the gland is studded with multiple miliary



Fig. 1.—Lymphogranuloma inguinale: ulcer.

abscesses having epithelioid cells arranged around them in a radiating palisade fashion.

Although the clinical picture is quite suggestive, a positive diagnosis cannot be made without the aid of the laboratory. Syphilis and chancroid must be ruled out. Although examination of an excised gland is helpful, most cases are diagnosed by means of the Frei test. This test consists of the intradermal injection of a small amount of diluted sterilized pus which has been aspirated from the gland of a proved case. The reaction is read forty-eight hours after injection, and is interpreted in the manner of any intradermal test. The positive reaction measures from 5 millimeters to 2 centimeters in diameter, and consists of erythema with some induration.

Treatment has been very unsatisfactory. Various chemotherapeutic agents, such as antimony compounds, have been tried. One of the latest treatments consists of an attempt at immunization by repeated injections of the Frei antigen.

The following case is reported because it is one of the earliest in California, and because the patient has never been out of the United States.

REPORT OF CASE

W. S., age forty-eight, white male, in 1927 was referred to one of us by Doctor Guerra of Alameda for treatment because of an ulceration on the tibial crest. He gave a history of a genital lesion twenty years previously, and a positive Wassermann reaction. A roentgenologist reported typical luetic periostitis. The ulceration healed rapidly under treatment with bismuth and arsphenamin. The patient disappeared from treatment and was not seen by us until 1931, when he returned because of an extensive ulceration around the anus plus a fibrotic annular stricture two inches above the anus. This was thought to be syphilis, and bismuth and neoarsphenamin therapy was instituted. No improvement followed until iodids in massive doses were given, after which the lesion healed in three months' time. The patient again stopped treatment, without permission, for three months, and suffered from a relapse of the ulceration. This healed a

second time, following the ingestion of huge doses of iodids by mouth; only to relapse this last time about October 1, 1933 (Fig. 1). Prior to this relapse he had returned to one of us because of an almost complete obstruction from the annular stricture, and a posterior midline complete direct fistula in ano. The stricture was divulsed after cutting it with a cautery, and the fistulous tract was opened with the cautery. Following these operations the stricture was gradually dilated and diathermy was used twice a week. A Frei test was strongly positive. We felt, therefore, that we were dealing with a case of lymphogranuloma inguinale.

Because of the knowledge of a preëxisting syphilis, the patient was given bismuth injections at weekly intervals, as well as two drachms of the saturated solution of potassium iodid three times daily. Injections of the Frei antigen have been given intradermally once a week. Each injection has produced an enormous positive reaction of one to two centimeters. Under such polytherapy, the patient has progressed to complete healing.

SUMMARY

One of the early cases of lymphogranuloma inguinale seen in California, showing a positive Frei reaction, is reported herein.

3115 Webster Street.
450 Sutter Street.

USE OF TONGUE BLADES

By HERBERT J. SAMUELS, M. D.
Oakland

IT is suggested, in making a mouth examination, to lubricate the tip of the wooden tongue-blade that is placed against the patient's lips, tongue or cheek, thus preventing the mucous membrane from adhering to the blade, which generally occurs when used dry, much to the discomfort and distress of the patient. The tip of the wooden blade should be dipped in mineral oil, or some bland ointment may be applied to it with an applicator or piece of gauze, before being placed against the tissues. This simple procedure permits the blade to be applied and turned against the tissues easily and without injury.

1319 Central Bank Building.

PROJECTION OF MICROSCOPIC SLIDES—FOR DEMONSTRATION OR PHOTOGRAPHY

By FRANCIS SENTER BASCOM, M. D.
Oakland

A METHOD for projecting microscope slides on a screen is here given for use in circumstances where a projecting microscope is not available, or cost prohibits its purchase.

By a simple rearrangement of the optical system of a standard microscope aligned with a "home movie" projector as the source of light, a clear projection may be obtained on a screen at any distance up to about thirty feet from the microscope or farther, depending on the power of the projection lens with which the projector is equipped.

The arrangement of the improvised projection microscope is as follows: Remove the eye-piece (A) and its reducing ring (B) from the draw tube. Unscrew the ring (D), which grips the draw tube, and remove it and the tube, then unscrew the flange (C), leaving the draw tube with-

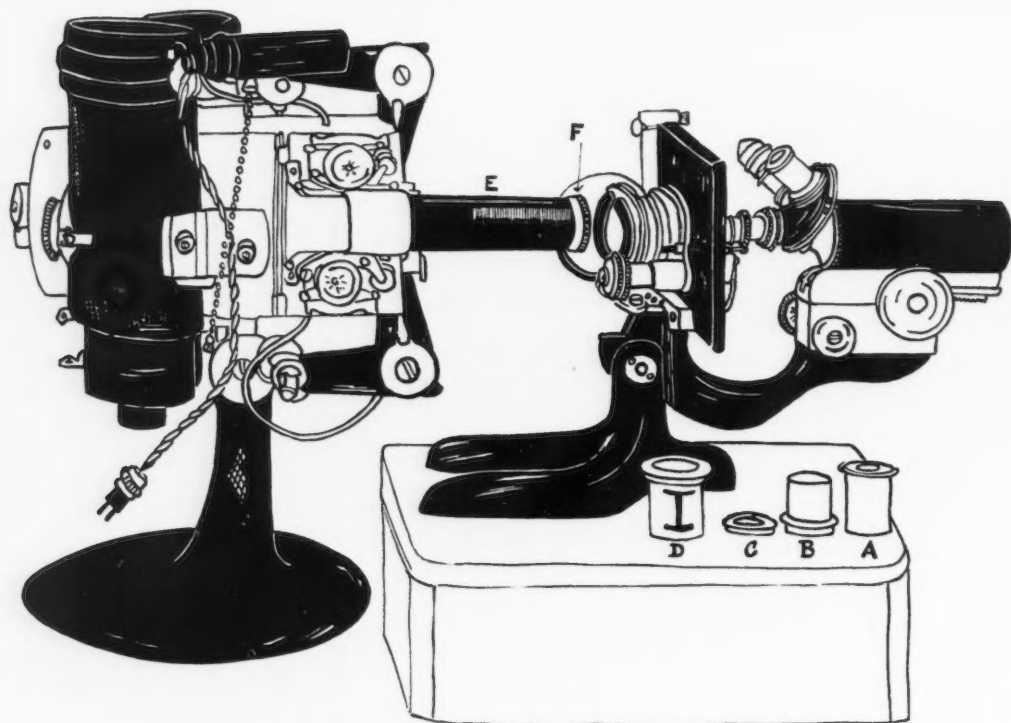


Fig. 1.—Showing rearrangement of microscope for projection of microscopic slides

out any attachments. Insert the projector lens (F) in the draw tube and mount this combination in place of the lens in the projector. (This may be done with a simple strip of tin bent into the form of a cylinder to fit inside the draw tube of the microscope and the projector lens opening.) Swing the barrel of the microscope into the horizontal position and carefully align barrel, condenser, and draw tube by standing the microscope on a box or any firm support of appropriate height. The projection lens should be an inch or less behind the condenser of the microscope, and exactly in line.

The home movie projector condensers should be in place. As the better models are equipped with the fan cooling device to protect the film in projection, the microscopic preparation is thus protected, as well as by its distance from the filament. (In such projector models as have a perforated safety screen, this screen should be raised after the microscopic preparation is in place by pressing the appropriate trigger on the projector.)

400 Twenty-ninth Street.

SUBUNGUAL EXOSTOSIS OF THE BIG TOE

By A. GOTTLIEB, M. D.
Los Angeles

THIS rather common condition under the big toe-nail is only casually mentioned in the textbook of surgery or orthopedics. The unfamiliarity with this type of exostosis leads one to regard it as an atypical form of ingrown nail; or it is

wrongfully diagnosed as a malignant growth, or is mistaken for granuloma pyogenicum, an infectious dactylitis, or for a cartilaginous or fibrous tumor.

The subungual exostosis is, without exception, of traumatic origin. In most instances the patient will recall an injury to the toe while dancing, or stubbing it against some hard substance. In a limited number of instances, short shoes and continuous irritation of the end of the phalanx may be regarded as the causative agent. The fact that not all cases of injury or short-shoe wearing lead to the formation of this growth speaks for either a predisposition to exostosis or suggests the requirement of a sufficient force to produce such bone proliferation. Younger people and the female sex are more prone to develop this growth, possibly because of growing bone in the former and ill-fitting shoes in the latter. It usually occurs unilaterally, and has its location on the inner half of the toe-nail; less frequently it is encountered in the center of the distal phalanx. The clinical picture varies with the length of the duration of the exostosis. Pain is the predominating symptom. It may develop gradually with the growth of the mass; or may come on rather suddenly after an acute injury to the toe.

In appearance the exostosis is a pinkish growth which protrudes through the nail, pushing it upward. It may have the size of a millet seed, or it may become as large as a hazel nut. The mass is usually smooth. Only in later stages may it have a cornified appearance or even be ulcerated. The nail becomes thinned and brittle, and eventu-

ally disappears entirely, leaving the tumor exposed to view.

The x-ray appearance of the exostosis is characteristic. The film shows a bony growth protruding from the end of the phalanx. The size appears smaller in the x-ray than in reality, because the mass is not fully ossified and does not throw the complete shadow picture. The base of the mass may still be cartilaginous and the top covered with fibrous tissue. The x-ray should be resorted to in all cases of persistent pain and tenderness of the distal phalanx, especially if the nail is raised from its bed. Any existing doubt as to the diagnosis will thus be cleared up.

The subungual exostosis is essentially benign, and will not recur after being thoroughly removed, when its matricular substance has been completely destroyed.

727 West Seventh Street.

SAFEGUARDED NEEDLE FOR HEMORRHOIDAL INJECTIONS

By FRANK M. MIKELS, M. D.
Los Angeles

THE injection method of treating hemorrhoids is now well established as an ethical and conservative therapeutic procedure.

Various chemical compounds have been used, the most common among them being phenol solutions and the aqueous solutions of quinin and urea hydrochlorid.

In simplifying the technique for the injection method of treating internal hemorrhoids, four essential procedures are necessary: (1) easy presentation of the hemorrhoidal mass; (2) adequate asepsis at the point of puncture; (3) the least possible traumatization of the mucosa at the point of introduction of the needle, with a definite stop to prevent too deep introduction of the needle; (4) and a chemical preparation which will give the quickest and most permanent reactionary effect, with complete reduction of the hemorrhoidal mass without sloughing.

The internal hemorrhoidal mass can be easily presented for inspection and treatment with Hirshman's anoscope, exposing a quadrant of the lower rectal zone with the hemorrhoid in view, if one is present. The anoscope can be easily rotated to present that region of the lower rectum having the hemorrhoidal mass, so that the mass bulges into the lumen of the anoscope over the proximal edge of the oblique aperture in good position for the injection.

In order to obtain an aseptic field for the introduction of the needle, it is best to have the usual cleansing enema prior to the examination; and then, just preceding the introduction of the needle, the hemorrhoidal mass should be thoroughly swabbed with cresitin, or some other local antiseptic solution, and a definite application of a stronger antiseptic solution made at the point of puncture.

In order to cause the least traumatization of the mucosa which already has been more or less

abraded and eroded, especially where there has been frequent bleeding from the hemorrhoid, a very small needle should be used, not over a 25 gauge. To avoid thrusting the needle too far into the hemorrhoidal mass, a safety-stop needle, similar to the illustration (Fig. 1), should be used.



Fig. 1.—A Safeguarded Needle for Hemorrhoidal Injection.

This needle has a metal bead welded to the shaft, one-fourth, three-eighths, or one-half inch from its end. The length of the needle should be at least one and one-half inches long. The aperture of the needle should be very obliquely beveled.

The needle should be plunged through the mucosa in a diagonal manner, prior to the injection of the sclerosing solution.

The point of injection of the hemorrhoid depends a great deal upon the size, extent and structural condition of the mass. The amount of solution to be injected also depends upon these factors. Five to ten minims of the 4 per cent aqueous solution of quinin hydrochlorid is usually sufficient to produce the necessary reaction to obliterate the hemorrhoidal mass. The best reactionary effect seems to be a sclerosis of the mucosa and submucosa, causing an indurated mass which gradually becomes absorbed and obliterated.

Immediate compression of the hemorrhoidal mass for about ten minutes with a firm, large cotton applicator, after the needle has been withdrawn, will diminish the amount and extent of the reactionary induration without interfering with the end-result. After the induration is absorbed, the rectal mucosa has a firm and elastic consistency, and is firmly adherent to the muscular coat.

The abnormal distention of the hemorrhoidal veins, arterioles and the venous lakes in the submucosa become completely reduced following this technique, and the induration becomes absorbed. Protrusion and ectropion of any residual hemorrhoidal mass is permanently prevented by the plastic infiltration which takes place between the mucous and muscular coats above the pectinate line.

7022 Sunset Boulevard.

The Way He Walks.—I need not describe to you in detail here the stamping, broad-based action of tabes dorsalis; the steppage, drop-foot gait of peripheral neuritis; the dragging spastic gait of the paraplegic and the hemiplegic; the festinant trot of the paralysis agitans; or the stiffening shuffle of old age. Their enumeration, however, brings me to the question of how we may best train our eyes to do better as time goes by. I would first of all tell you simply to make a rule of having a good look at every patient as he walks into your presence or sits or stands or lies before you. To avoid embarrassment ask a question or two by all means, but study him well meanwhile. The art of medicine is largely the art of noticing. You need to cultivate constantly both the enthusiasm and the watchful patience of the field naturalist if you wish to obtain the full value and interest which clinical work can bring.—Ryle, J. A.: *The Training and Use of the Senses in Clinical Work*, *Guy's Hospital Gazette*, 47:421 (Oct. 28), 1933.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

AMEBIASIS

ETIOLOGY

JOHN F. KESSEL, PH.D. (University of Southern California, Los Angeles).—The term "amebiasis" is used to imply a state of infection with *Entameba histolytica*, which protozoön is the recognized pathogen of intestinal amebae. Occasional reference is made to the pathogenic rôle of species of intestinal amebae other than *E. histolytica*, but affirmative data on this point are lacking and, until convincing proof can be obtained, all other intestinal amebae must be regarded as commensals. Individuals who harbor *E. histolytica* in the intestinal tract do not all experience clinical symptoms, any more than do all persons who harbor *Corynebacterium diphtheriae* suffer from diphtheria.

Since *E. histolytica* is a facultative parasite, one finds three conditions resulting from its presence in the bowel: first, the acute ulceration or amebic dysentery; second, chronic amebiasis; and third, the "carrier" condition.

In a recent study involving some two hundred cases positive for *E. histolytica* in the Los Angeles County General Hospital, 21 per cent showed symptoms of acute amebic dysentery; 60 per cent were diagnosed as suffering from chronic ulcerative conditions, and 19 per cent exhibited no subjective symptoms, and might be classed as "carriers." Ten per cent of the cases in this series showed amebic liver abscess.

It is a question of considerable doubt as to just what factors are responsible for these differences in pathogenicity. Several explanations have been given. (1) Brumpt¹ feels that there are marked differences in virulence, these being so great that he names two species, *E. dysenteriae*, which he considers to be pathogenic, and *E. dispar*, morphologically identical but which he thinks is non-pathogenic. (2) Other investigators claim that all races of *E. histolytica* are a potential danger, and that the resistance of the host is the major factor in determining invasiveness. (3) Other writers attach a great deal of significance to the factor of climate, claiming that a tropical climate, with its higher temperature and marked humidity, is primarily responsible for acute exacerbations of amebic infection.

Kessel² was able to produce pathology in kittens inoculated with amebae, both from "carrier" cases and from cases showing acute amebic dysentery, and feels that a person who shows cysts in his stools, even without giving evidence of clinical

symptoms, may be a source of danger. Recently Cleveland³ and Meleney⁴ have demonstrated a variation in virulence of different races of *E. histolytica*, judged by their effect in kittens. They have not shown, however, that *E. histolytica* from carriers is non-pathogenic to kittens when inoculated into the intestinal tract, nor that *E. histolytica* from carriers is always less pathogenic than are amebae from acute cases. Meleney's Strain B 3, from a carrier, produced greater pathogenicity in kittens than his Strains A 2 and B 1, which were from acute cases.

Summarizing from these opinions, it is safe to assume that host resistance, racial variation of the amebae and climate are all factors in determining the degree of pathogenicity produced by *E. histolytica*.

Rapidity of Spread.—Amebiasis may be described as endemic in character. It seldom, if ever, assumes the proportions of a widespread epidemic. The Chicago outbreak illustrates the fact that amebiasis is less easily transmitted than bacterial diseases. For the number of persons presumably exposed, only a very few have developed the disease. One shudders to estimate the proportions that the epidemic might have assumed had the food handlers in question been carriers of bacillary dysentery rather than of amebic dysentery. Without doubt the epidemics of tropical dysentery that were described in the earlier literature were bacillary rather than amebic in character.

This self-limitation of amebiasis is due mainly to two facts: (1) the incubation period is often long, varying from one to several weeks, and (2) persons suffering from acute amebiasis, and who are passing trophozoites, are not so likely to transmit the infection, since trophozoites are not as resistant as cysts to the destructive processes of the upper gastro-intestinal tract. It is the "carrier," or the case with chronic amebiasis, that is the greatest source of danger in spreading amebic infection.

Transmission.—Amebiasis may be transmitted through several channels:

1. Animal reservoir hosts. Rats, mice, dogs, the domestic pig and monkeys have all been shown to harbor strains of *Entameba histolytica*, which will produce pathology in kittens. These animals may occasionally serve as sources of infection to man.

2. Insect vectors. Notable among the insects which may transmit amebiasis is the house fly.

³ Cleveland, L. R., and Sanders, Elizabeth P.: The virulence of a pure line and several strains of *Entameba histolytica* for the liver of cats and the relation of bacteria, cultivation, and liver passage to virulence, *Am. J. Hyg.*, 12:569, 1930.

⁴ Meleney, Henry E., and Frye, William W.: Studies of *Entameba histolytica* and other intestinal protozoa in Tennessee: V. A comparison of five strains of *E. histolytica* with reference to their pathogenicity for kittens, *Am. J. Hyg.*, 17:637, 1933.

¹ Brumpt, E.: Individualité de l'*Entameba dispar*. Présentation de pièces, *Ext. Bull. Soc. Path. exot.* 19:399, 1926.

² Kessel, John F.: Amebiasis in kittens infected with amebae from acute and "carrier" human cases and with the tetranucleate amebae of the monkey and the pig, *Am. J. Hyg.*, 8:311, 1928.

This may be accomplished mechanically, or the fly also has been shown to ingest and to harbor cysts of *E. histolytica* for some hours, which were recovered later in a viable state. In regions where sanitation is poor, and the house fly ingests fecal material containing cysts, it is undoubtedly a means of spreading amebic infection.

3. Night soil as fertilizer. In the Orient, where human feces are used extensively for fertilizer, such material is a source of danger in the spread of all diseases disseminated through the gastrointestinal tract. In the United States, however, where untreated sewage is not commonly used for fertilizer, this danger is minimal.

4. Water supplies. If cysts of amebae gain access to water reservoirs or supplies, they may remain viable at least for a period of thirty days. The chlorination processes that would ordinarily destroy vegetative bacteria are insufficient to kill cysts of *E. histolytica*. All contamination of water supplies by fecal material, therefore, possesses possibilities as a means of spreading *E. histolytica*.

5. The human carrier. In cities and regions where human excrement is disposed of by adequate sewage systems, there is little danger of transmission of amebiasis excepting by the human carrier. Here the food handler, whether in the private home or the public restaurant, is the source of greatest danger. This fact has frequently been emphasized in the past, and has recently been impressed upon us by the painful Chicago experience, which already has become and will remain a classic in the history of amebiasis.

This catastrophe points out plainly the necessity of routine examination of food handlers, not only for *E. histolytica*, but for other pathogenic microorganisms found in human feces, and the removal of these carriers from such duties.

Another point which is being illustrated by the aftermath of the above-mentioned episode, and one which has often been emphasized by workers in the field of amebiasis, is the frequency with which familial infections occur.

Incidence.—The incidence of amebiasis in California as compared with the incidence of infection in other regions is of special interest. There are no extensive surveys which give the incidence in our general population. With the exception of certain special groups of students who perhaps do not represent the population at large, Kofoid's⁵ statistics, which give a percentage of 13.1, are for the most part from cases who have been suspected of exhibiting intestinal symptoms. The same fact applies to the various sets of hospital statistics compiled by the author and by others within the state. These may be either higher than the population at large, if they represent a series of cases suffering from chronic colitis suspected of being amebic in character, or they may be too low if they represent a series of cases of acute dysentery examined in a region where bacillary dysentery is common, *e. g.*, in the Los Angeles County General Hospital, where we average

twenty cases of bacillary dysentery to one of amebic dysentery; and yet stools from all cases of dysentery are examined both for intestinal protozoa and for dysenteric bacteria. Our present percentage of incidence of amebiasis is approximately 3.5 as compared with an original percentage of 9.8, when fewer cases of bacillary dysentery were included in our examinations. The recent survey of Johnstone *et al.*⁶ on a group of one thousand inmates of San Quentin Prison, in which an incidence of 9.2 per cent was found, represents an institutional group. Institutional statistics of communicable diseases are not always representative of a population at large, since the factors of personal hygiene and crowding may alter the incidence.

Further, there is undoubtedly a marked variation in the incidence of amebiasis within various subgroups of the population. One would expect a Mexican or a rural population, whose sanitary habits are not always identical with an urban population, to show different percentages of amebic infestation. In the Los Angeles County General Hospital, where the Mexican patients comprise less than 20 per cent of the hospital population, 43 per cent of the cases of amebiasis have been encountered among Mexicans.

A conservative estimate, based on a comparison of local figures with the surveys mentioned above, would yield an average incidence of amebiasis infestation in California ranging between 5 and 8 per cent. This percentage, compared with recent sets of figures from rural districts of various of the Southern States, is rather low. Urban and hospital statistics from the Southern States are lower than results from these restricted rural areas. Our figure, however, compares favorably with original estimates by Boeck and Stiles,⁷ for the United States as a whole and with other more recent surveys in the north and eastern part of the United States.

In conclusion, it may be stated that amebiasis is a disease which is endemic among us, but on account of its natural slowness of transmission and of our modern methods of sewage disposal, it is likely that it will only rarely gain epidemic proportions. It is, nevertheless, an important problem (1) to the clinician who frequently encounters cases of amebic infection and who should be on the alert to accurately diagnose the same, and (2) to the public health official who is responsible for the control of the disease. It would seem that the examination of food handlers and the removal of "carriers" should be his chief objective.

* * *

DIAGNOSIS

RAWSON J. PICKARD, M. D. (520 E Street, San Diego).—The diagnosis of an amebic infection is a laboratory diagnosis, to be made in the labora-

⁵ Kofoid, C. A.: Statistical summary of persons examined for protozoa in California, State Board of Health Twenty-ninth Biennial Report, Sacramento, Calif., California State Printing Office, p. 93, 1926.

⁶ Johnstone, H. G.; David, N. A., and Reed, A. C.: A protozoal survey of one thousand prisoners. With clinical data on ninety-two cases of amebiasis, *J. A. M. A.*, 100:728, 1933.

⁷ Boeck, W. C., and Stiles, C. W.: Studies on various intestinal parasites (especially amebae) of man, *Bull. No. 133, Hyg. Lab., Washington*, 16:202, 1923.

tory of a pathologist who is interested in and a student of parasitology.

The symptoms that call for an examination of the feces for the presence of intestinal protozoa are varied; many symptoms are toxic or allergic, but there is always a history of abdominal disturbance. In general, it may be said that a stool examination should be made, competently, whenever with abdominal disease the diagnosis is not a certain one of an illness distinctly not parasitic. This precaution would save a few patients from unnecessary operations on the gall-bladder and appendix, and many others from a long delay in receiving specific treatment.

Acute dysentery, with mucopurulent or bloody frequent stools with tenesmus, is oftener bacterial than protozoan even in the tropics. Amebic dysentery has a gradual onset, does not occur in epidemics, and the temperature is not high (uncomplicated). Ravaut warns as to false interpretations of weak agglutinations against the bacilli of dysentery. And both infections may be present. The differential character of the discharge has been noted by Haughwout and Callender: isolated nuclei (30 to 80 per cent), Charcot-Leyden crystals, clumped red cells in amebic, 90 per cent pus cells, and macrophages showing fatty degeneration, "ghost cells" in the bacillary type.

The great majority of cases of amebiasis, according to Boyers, are the chronic infections with "fatiguability, abdominal discomfort (bowel conscious), neuritic symptoms, joint pains, and digestive disturbances." Craig says that nearly all *E. histolytica* infections are accompanied by indigestion, short diarrheas alternating with constipation, abdominal tenderness, neuralgias, general lack of vitality, and underweight. "Most 'carriers' have symptoms of their infection at some time, and require treatment for it." Boyers has recently emphasized the frequency, in most cases of amebiasis, of measurably increased liver dullness. Ravaut finds the clinical picture so definite that he recommends a therapeutic test when laboratory confirmation fails. No one should be given powerful drugs on such an untenable "diagnosis." But certainly when protozoa are found, it is advisable to use a therapeutic test before proceeding to an operation, even though the protozoan is a common one among the lower animals and frequent in man. The foregoing indications for stool examination may seem vague, but it is in cases in which the diagnosis is vague that protozoa should be most diligently sought. The symptoms of short, unexplained diarrheas, habitual constipation and abdominal distress are characteristic. "Intestinal protozoa should be suspected in every enteritis, hepatitis or other unusual disturbance that has not been proved up" (Ravaut).

In dysenteric stools the amebas are readily found in fresh preparations on warmed slides. The large active amebas with clear pseudopodia, even when containing red cells, may be the "Councilmania" variety of *E. coli*, not at present generally accepted as a species; but the error of mistaking them for *E. histolytica* is of no clinical importance, as the treatment is the same for both pathogenic

amebas. Melnotte, in a review of twenty thousand stool examinations in Morocco, noted the "frequency of eight nucleate cysts" in patients with dysentery and various digestive disorders, and the clinical and microscopic cure of these patients with amebicides. Both he and Remlinger, apparently unaware (1928) of Kofoid's work, speak of the presence in Fez of forms intermediary between *E. histolytica* and *E. coli*, suggesting that perhaps it is a new species resembling both.

Except in dysentery, the examination should be made on a series of three, preferably six, daily stools obtained after giving bile salts, phosphosoda or bile to bring out the cysts. Stools containing oil, bismuth, or barium are useless. Wet fixed preparations stained with iron hematoxylin should be made from each specimen, for which a simple practical technique has been described by Pickard and Rice (1932). Reed and Johnstone (1932) advise sigmoidoscopic examination, making smears directly from ulcers which, when fixed wet, can be sent to a laboratory for staining and diagnosis. Dobell and O'Connor's "Intestinal Protozoa," Craig's "Parasitic Protozoa," Brumpt's "Parasitologie," Kofoid's reprints, are texts, all of which should be at hand for consultation. Their differences are instructive. The *E. histolytica* found in the chronic infections group Brumpt regarded as a separate species and as not pathogenic (1927. A fifth edition of his book is in press. . . .) The ameba in these cases without dysentery is clinically a different species. Simic, and Frye and Meloney have shown, experimentally, on animals, that amebic strains differ in pathogenicity. These controversies do not greatly concern the physician or his patient. The former will often find that the latter, presenting symptoms described as causable by amebiasis, shows instead a heavy infection with other protozoa. Melnotte gives giardia, chilomastix, and trichomonas in order of frequency, as causative agents of flagellate diarrhea, occasionally of dysentery. Perhaps chilomastix is commonest here. In any case appropriate therapy, such as the carbarosone recommended by Reed, and omitting emetin as a drug dangerous for general use in the temperate zone, will bring satisfaction to the patient even though the doctors may disagree as to why.

The chief difficulty in diagnosis is with the small races of amebas quite commonly found in the cases with a long history. An ameba or its cyst less than eight micra in diameter rarely shows the picture of an *E. histolytica* in miniature, on the "homunculus" order (shown in the text of Brumpt as *E. hartmanni*), by Dobel as the minute race of *E. histolytica*. The nuclear chromatin will often be clumped in a largish dot; on repeated daily search a time may come when the picture typical of *E. histolytica* is presented. Naturally, the usual appearance is that of the harmless *E. nana*. Cultures will clear the diagnosis. Cultures are not practical as a routine for self-supported laboratories. The time is better spent with the microscope. Iodin eosin preparations are never as diagnostic as the iron hematoxylin, and save no time in the end.

The diagnosis of the intestinal amebas must be made from the examination of the stained cysts. The difficulties of the diagnosis are sufficient to keep the workers in this field interested and require coöperation with the clinical side. This field is not one of those, if there are any, that are in the scope of the commercial laboratories practicing medical diagnoses.

* * *

CLINICAL AMEBIASIS

ALFRED C. REED, M. D. (350 Post Street, San Francisco).—There is a certain melancholy satisfaction, after some fifteen years of preaching in the wilderness on the dangers of amebiasis and its endemic and frequent appearance in the population of the United States, to find strong confirmation for these views in the recent disastrous epidemic in Chicago. A brief recapitulation of some of the clinical features involved, in the light of personal knowledge of the Chicago situation, may be of use.

Diagnosis.—It is to be remembered first, last and always, that diagnosis depends on one thing alone, and that is microscopic demonstration of *Endameba histolytica*. The disease should be suspected in all cases with gastro-intestinal symptoms, and also in all other cases of obscure nature whose diagnosis is not evident. Fresh stool specimens alone should be examined. These should be examined fresh immediately after being passed, in saline emulsion, and with iodine or Lugol solution stain. At the same time, smears should be made with camel's hair brush on clean slides, kept wet, and immediately immersed in Schaudinn's solution, according to the technique published by Reed and Johnstone.¹ These slides can then be sent to a reliable laboratory, for iron hematoxylin stain and final diagnosis. There is no characteristic symptomatology. Acute dysentery is becoming increasingly prevalent in California. In acute malignant cases there may be fever, but otherwise fever is not present except as the result of pyogenic secondary infection. There is no change in the blood count, gastric content or urine, in any way characteristic of amebiasis.²

Surgical intervention in cases which are essentially amebic is extremely dangerous, and has accounted for a high death rate during the past six months in this country. Gangrene of the bowel, perforation and peritonitis are prone to follow. Amebic infections should be cleared before operation when appendicitis, acute gall-bladder disease, perforated ulcer, etc., are suspected. It is to be remembered that liver abscess is prone to occur in the present epidemic in the early stages of the infection, and must always be suspected when there is pain in the region of the liver, low temperature and low or moderate leukocytosis.

Preventive Measures.—It is also important to remember that, in the present epidemic, for the first time, acute cases of dysentery tend to show

cysts in the stools. This means that acute cases may be contagious, a thing that has not been considered probable or possible before. The housewife or food handler of the family or hotel or restaurant must always be under observation when amebiasis comes into account. Personal hygiene, clean hands, avoidance of contamination of food and drink, are the best means of prevention. A major factor in the Chicago epidemic appears to have been water carriage from sewage contamination of hotel water supplies. This does not mean that it is necessary to have intensive surveys of food handlers and of employees of hotels in general all over the country. It does mean exactly the following, and this is the important lesson from the whole epidemic. Practicing physicians must be trained to suspect amebiasis, and to report it immediately on its diagnosis in all cases coming to their attention. The local board of health then has a definite normal endemic index of occurrence of cases. Whenever this index increases, the board of health immediately surveys the location in which the increase has occurred. In this way epidemic dangers are nipped in the bud. There is a clean-up of all local foci of infection, and the public health is adequately protected. Other methods are too expensive, too complicated and too uncertain to offer practical value.

Treatment.—Treatment preferably should be by the use of carbarsone, two or three capsules, each containing 0.25 grams, daily for ten days by mouth. In the presence of ulceration of the lower bowel, which is marked or serious, carbarsone irrigations may be given, as described by Anderson and Reed,³ as follows: Two grams of carbarsone are dissolved in 200 cubic centimeters of one per cent sodium bicarbonate. After a preceding cleansing enema, this solution of carbarsone is gently injected at body temperature into the rectum and retained as long as possible, preferably overnight. This procedure is followed for six consecutive nights. It is usually better to give the carbarsone course by mouth first, and follow with the rectal course if such be indicated, rather than give the two together. When liver abscess is suspected, or there are symptoms referable to the liver, it is preferable to give one grain emetin hydrochlorid daily hypodermically for five days, and then follow with carbarsone, as indicated above, provided there is no evidence of serious renal or liver damage. Vioform may be substituted for carbarsone, or alternated with it, giving 0.5 grams in gelatin capsules twice a day for ten days. In every case it is necessary to follow the stools for six months after termination of treatment, examining three specimens each two weeks, before one can be reasonably assured of actual protozoölogic cure. Once more the caution must be given that emetin is a dangerous drug; that it makes no difference by what method it is given; that only the total dosage is important; and that there is definite danger of poisoning of the heart muscle, and that this poisoning is often more or less permanent.

¹ Reed, Alfred C., and Johnstone, Herbert G.: Method for Diagnosis of Amebiasis, *J. A. M. A.*, 99: 729 (Aug. 27), 1932.

² Reed, Alfred C.: Clinical Amebiasis, *CALIFORNIA AND WESTERN MEDICINE* (Jan.), 1934.

³ Anderson, H. H., and Reed, Alfred C.: Carbarsone Rectally in Amebiasis, *Amer. Jour. Trop. Med.*, May, 1934.

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EDITORIALS*

AN INJUSTICE WHICH SHOULD BE REMEDIED

Polio myelitis and a County Hospital.—Reference to the present polio myelitis outbreak was made in the June issue of CALIFORNIA AND WESTERN MEDICINE, and will be found on pages 410 and 428. In the same number, on page 427, were comments on the thirteen-million-dollar massive unit, recently dedicated, of the Los Angeles County Hospital; one of the subparagraphs, in those remarks, bearing the caption: "Why Unappreciation Exists." Mention is made of these two topics, because certain more recent events, affecting the care of polio myelitis patients at the Los Angeles County Hospital, have created a proper basis for calling attention to what is little less than a deplorable situation. Since similar conditions can easily come into being in other counties of California, the subject should be of general, as well as local interest.

Problems Which Have Arisen in the Present Polio myelitis Epidemic.—To understand the following statements, the situation that exists at the time these lines are written should be briefly

* Editorials on subjects of scientific and clinical interest, contributed by members of the California Medical Association, are printed in the Editorial Comments column, which follows.

sketched. Director J. D. Dunshee of the State Board of Health, in his article in last month's journal (page 410), pointed to the fact that this year the epidemic of polio myelitis in California had started earlier than with previous outbreaks, and that the indications pointed to a still more serious visitation. At this writing, the epidemic is largely localized in southern California, but the wave will probably branch northward. Because the members of the California State Board of Health also felt that the spread of the disease had created a serious situation, they authorized the printing and mailing to every physician in California of a brochure reprint originally brought out by the American Medical Association in 1933 and entitled, "Suggestions on Polio myelitis."

Elsewhere in this issue, too (see page 69) are printed some press and other reports on the later incidence of polio myelitis in California. On June 14, for instance, at Los Angeles, in the new acute unit of the County Hospital, there were a total of 319 polio myelitis in-patients registered; and in addition, 199 in-patients were under observation for possible polio myelitis.

* * *

Doctors and Nurses Go Down with Polio myelitis.—These polio myelitis in-patients at the Los Angeles County Hospital included three resident physicians, one interne, and twenty-four nurses, all of whom had contracted the disease while in the institution—a fact receiving mere passing notice in the lay press, although the space and comment there allotted were nothing comparable to that usually given to cases of injury to two or three policemen or firemen; yet these physicians and nurses, in the quiet and difficult performance of their duties, have contracted a dread disease that may disable one or more of them, more or less permanently.

* * *

A Distressing Phase of the Situation.—But that is not all; the worst feature is this: these same attending and resident physicians, internes and nurses (if they shall have become disabled while in the performance of duty—while they were thus bravely and unostentatiously risking both their future and their very lives in caring for the sick of the Los Angeles County Hospital) can at the time of this writing expect from the rich County of Los Angeles little or even no monetary or other aid in the way of recompense for such disability. In other words, these physicians and nurses who shall have made so great a, and perhaps almost the supreme sacrifice, cannot look forward, if impaired and dependent, to any support from the public treasury, as may, and properly, our policemen and firemen! Indeed, the resident physicians, while incapacitated and under treatment in the hospital, cannot receive even their "regular, full" pay. The internes, with their modest monetary stipends of ten dollars per month, and the student nurses with even less, or no stipends at all, need not worry about immediate financial recompense during illness, because, from the money standpoint, they receive at most practically nothing and, therefore, from the legal standpoint, can never ex-

pect anything whatever. The special nurses, on duty at about fifty cents an hour, could likewise receive little or comparatively nothing. However, these internes and nurses have equal right to worry about post-illness sequelae, because such end-results may mean the same partial or total disability as is possible to accrue to lay patients. These facts are presented because they show some of the possible tragical consequences, from the standpoint of individuals directly affected, when the medical profession, through overmodesty or other cause, fails to place before the public, in ample time, its just claims for fairer treatment to disciples and assistants.

* * *

Inconsistency in Rewards.—In this particular case of the County of Los Angeles, therefore, we are thus confronted with a most startling fact or two: first, that the county has just completed a thirteen-million-dollar hospital building, paying the architects alone one million dollars for service entailing no risk of life or limb, and secondly, that while a poliomyelitis outbreak in the county has caused an influx of a large number of infantile paralysis patients into its public hospital (no private hospitals admitting such patients), resulting in the infection of almost thirty of the county's doctors and nurses, there is not a penny in any fund to compensate these public servants in case of permanent disability. Surely the rewards to the architects, on the one hand, and to the doctors and nurses, on the other, seem incongruous, or worse, do they not?

* * *

Are Conditions Which Exist Fair?—The unhappy possibilities outlined above are under consideration by members of the Medical Board of the Attending Staff, and as will be seen from the resolutions printed on page 69 of this issue, steps have been taken to acquaint the county officials with the facts. Under present conditions, it is not to be wondered at that some of the internes and nurses are reluctant to go on service in the poliomyelitis wards. To be overworked to the point of exhaustion, thus predisposing to infection, and at any moment to be stricken down, with the possibility of more or less permanent disability and dependence upon others; and yet to know, at the same time, that not one penny, or only a very meager amount of money or pension support, will ever come from the rich community in whose name, and on whose behalf such service is rendered, is to create a state of mind wherein it is natural for a thinking individual to ask himself, "For whom, and for what, do I take these great risks to myself, as well as to those to whom I myself am most dear; and why should I, under such circumstances as exist, even venture so to do?"

* * *

Rôle of the Physician in Private Practice Is Different.—Once a physician takes up his work in private practice, he willingly assumes the various risks incident to the life and labors of his profession. This is proven everywhere, day after day, and under all forms of circumstances; and

that is why Stevenson wrote his well known, glowing tribute to the physician.* There is a difference, however, between such a physician in private practice, and the interne or nurse in a public hospital, where, as members of the personnel of such a hospital, these latter are employed by the taxpayers for public service. Such interne or such nurse employees, receiving little or no wages from their employers (the taxpayers), are certainly entitled to the same kindly treatment from the citizen-employing public, accorded, through statute, by the taxpayers to policemen and firemen who, in their respective fields, may be called upon to risk their lives in performance of duty on behalf of the public. Surely the care of citizens whose health and lives are imperiled, and who, if left uncared for, may menace the health and lives of fellow citizens, is as noble a work as that already referred to, and gladly acknowledged, of the police and fire departments. With diseases like poliomyelitis, the proportionate danger to the personal health and lives of those who are called upon to minister, as physicians and nurses, is quite as great or greater than that to which police-guardians or fire-fighters are exposed.

* * *

The Board of Supervisors Should Take Action.

It is hoped, therefore, that the Board of Supervisors of Los Angeles County, and boards of other California counties facing similar conditions, will immediately take steps to inaugurate, through proper orders or ordinances, the necessary protection of county hospital employees, such as physicians and nurses.† If the point is raised that there is not sufficient legal authority to institute these measures of plain justice to faithful servants of the community, then plans should be made to secure adequate enabling or other laws to cover the needs in question at the state legislative session which will convene at Sacramento on January 2, 1935. The matter is one of vital importance. Movement for protective measures should be pushed before the public forgets its own scares, such as the dread of infantile paralysis.

In the meantime, as indicated in the resolutions printed on page 69, some of these ends can be attained by having county hospital authorities hire emergency physicians and graduate nurses on

* "There are men, and classes of men, that stand above the common herd, the soldier, the sailor, the shepherd not infrequently, the artist rarely, rarer still the clergyman, the physician almost as a rule. He is the flower of our civilization, and when that stage of man is done with, only to be marvelled at in history, he will be thought to have shared but little in the defects of the period, and to have most notably exhibited the virtues of the race. Generosity he has, such as is possible only to those who practice an art, and never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Herculean cheerfulness and courage. So it is that he brings air and cheer into the sick room and often enough, though not so often as he desires, brings healing."—Robert Louis Stevenson.

† At a special meeting of the Advisory Board of the Attending Staff of the Los Angeles County Hospital, held on June 15, resolutions were passed requesting the Board of Supervisors to place on adequate salary all internes, nurses or other employees, when symptoms of poliomyelitis became manifest. By that procedure, in case of disability, such salaried employees would come under the provisions of the Industrial Compensation Act. It is gratifying to record that the Board of Supervisors took favorable action in these matters. Further information is given on page 69.

ample salary, so that if disability from paralysis should come through such employment, the Industrial Accident Act would permit disability ratings that could compensate somewhat for lack of pensions. It would seem easy, therefore, to render justice in these matters if only the will exists to do so. Present-day economic stress and strain should not thrust themselves forward as a supposedly-legitimate argument in these circumstances. As previously stated, now is the time to hammer home some homely truths, and to establish present and future beneficial procedures.

PRESIDENT ROOSEVELT'S MESSAGE ON SOCIAL WELFARE

Last month's CALIFORNIA AND WESTERN MEDICINE printed the minutes of the Riverside meetings of the California Medical Association's House of Delegates and Council. The Committee of Five, authorized by the House of Delegates to make a study of the costs of sickness and its relation to social, economic and other factors, has before it a large task, and in its labors will need the aid and coöperation of all members of the California Medical Association.

When President Roosevelt sent his June 8 message to Congress, the lay press gave generous comment thereto. For those readers of CALIFORNIA AND WESTERN MEDICINE, who did not have an opportunity to read the message in its entirety, the following paragraphs, dealing with social welfare factors (health insurance was not specifically mentioned in this message; may come later), should be of interest:

Washington, June 8.—The text of President Roosevelt's message to Congress today follows:

"You are completing a work begun in March, 1933, which will be regarded for a long time as a splendid justification of the vitality of representative government. . . .

"Among our objectives I place the security of the men, women and children of the nation first.

"This security for the individual and for the family concerns itself primarily with three factors. People want decent homes to live in; they want to locate them where they can engage in productive work, and they want some safeguard against misfortunes which cannot be wholly eliminated in this man-made world of ours. . . .

"The third factor relates to security against the hazards and vicissitudes of life. Fear and worry based on unknown danger contribute to social unrest and economic demoralization. If, as our Constitution tells us, our Federal Government was established among other things 'to promote the general welfare,' it is our plain duty to provide for that security upon which welfare depends.

"Next winter we may well undertake the great task of furthering the security of the citizen and his family through social insurance.

"This is not an untried experiment. Lessons of experience are available from states, from industries and from many nations of the civilized world. The various types of social insurance are interrelated; and I think it is difficult to attempt to solve them piecemeal. Hence, I am looking for a sound means which I can recommend to provide at once security against several of the great disturbing factors in life—especially those which relate to unemployment and old age.

"I believe there should be a maximum of coöperation between states and the Federal Government. I believe that the funds necessary to provide this insurance should be raised by contribution rather than by

an increase in general taxation. Above all, I am convinced that social insurance should be national in scope, although the several states should meet at least a large portion of the cost of management, leaving to the Federal Government the responsibility of investing, maintaining and safeguarding the funds constituting the necessary insurance reserves.

"I have commenced to make, with the greatest of care, the necessary actuarial and other studies necessary for the formulation of plans for the consideration of the Seventy-fourth Congress.

"These three great objectives—the security of the home, the security of livelihood, and the security of social insurance, are, it seems to me, a minimum of the promise that we can offer to the American people. They constitute a right which belongs to every individual and every family willing to work. They are the essential fulfillment of measures already taken toward relief, recovery and reconstruction. . . .

"We must dedicate ourselves anew to a recovery of the old and sacred possessive rights for which mankind has constantly struggled—homes, livelihood, and individual security. The road to these values is the way of progress. Neither you nor I will rest content until we have done our utmost to move further on that road.

(Signed)

"FRANKLIN D. ROOSEVELT."

AMERICAN MEDICAL ASSOCIATION AND HEALTH INSURANCE

For those readers who do not receive *The Journal of the American Medical Association* (in which publication the full proceedings of the American Medical Association House of Delegates will be printed), a short digest of the action taken in relation to health insurance, as given in Associated Press dispatches, is here reprinted. It will be noted that the principles therein laid down are those of the Council and Department of Public Relations, which, through the House of Delegates, have also been emphasized by the California Medical Association. The summary is worthy of perusal, because these fundamental principles must be kept in mind in the elaboration of health insurance plans which would have the endorsement of the medical profession. Quotations follow:

"The principles evolved in the executive session (of the American Medical Association House of Delegates) for guidance of members in communities where 'some experiment to change the method of administering medical service' is attempted, insist:

"That all features of medical service be under the control of the medical profession, for 'no other body or individual is legally or educationally equipped to exercise such control.'

"That 'no third party' must be permitted to come between patient and physician in any medical relation; that patients must have absolute freedom in choosing their doctor; that the method of giving service must remain a 'permanent, confidential relation' between patient and 'family physician.'

"That all medical phases of all institutions involved in the medical service should be under professional control, 'it being understood that hospital service and medical service should be considered separately.'

"That however the cost of medical service may be distributed, the immediate cost should be borne by the patient able to pay at the time the service is rendered; that medical service must have no connection with any cash benefits; that any form of medical service should include all qualified physicians of the locality covered who wish to give service.

"That systems for the relief of low-income classes should be limited strictly to those below the 'comfort level' standard of income, and that there should be no restrictions of treatment or prescribing not formulated and enforced by the organized medical profession."

POLIOMYELITIS STUDIES AT LOS ANGELES COUNTY HOSPITAL

The June CALIFORNIA AND WESTERN MEDICINE, on page 410, in the article on the present status of epidemic poliomyelitis, by Director J. D. Dunshee of the State Board of Health, printed a line cut showing the California incidence curves of the disease in the years 1925, 1927, 1930 and 1934. This year its morbidity is running less true to past form. An increasing number of cases may be expected as the disease travels northward from southern California. The outbreak has attracted the attention of medical men and research workers throughout the United States. In addition to the representatives from the Rockefeller Foundation, it is possible that other research workers will come to California to study the disease. The following news account, taken from the Los Angeles Times of June 18, in which attention is called to the arrival at the Los Angeles County Hospital of representatives from the Rockefeller Institute and Yale University, may have interest to physicians in other parts of the state:

"Arriving on the Santa Fe from the East yesterday afternoon, Dr. John R. Paul and Dr. Leslie T. Webster, sent to Los Angeles by the Rockefeller Medical Institute for research work in connection with the poliomyelitis outbreak, dodged all attention from a social standpoint and within an hour were established in the laboratories in the city health building planning a program of intensive work.

"The two were met at Pasadena by City Health Officer George Parrish, who interested the institution of the survey at the expense of the Rockefeller Foundation. . . . They declined to make any statements except that they are here to work.

"Doctor Paul is from Yale Medical Institute and Doctor Webster is one of the chief assistants to Dr. Simon Flexner, head of the research bureau of the Rockefeller Institute. It was Doctor Flexner who, in 1910, obtained the first definite theory that infantile paralysis is caused by a filterable virus, but little has been learned in addition as to the source and prevention.

"It is the plan of the two physicians, with the assistance of Dr. James F. Trask, of Yale Medical Institute, who will arrive Sunday, to undertake exhaustive laboratory tests and research in an effort to isolate the poliomyelitis virus and, through inoculation experiments with monkeys, seek prevention of the disease in the interest of humanity.

"The result of their tests, it was intimated, will not be made public until they have returned and made their report to Doctor Flexner of the Rockefeller Institute.

"Chief concern was expressed by the two physicians for the care of twenty monkeys brought with them from the East for inoculation experiments. Doctor Paul expressed opposition to any special attention being given by strangers to the simians, stating that they had become excited and nervous on the train trip and that it is very necessary for the success of experiments that they be kept quiet and allowed to rest. . . ."

DR. GEORGE G. REINLE ELECTED VICE-PRESIDENT OF THE A. M. A.

At the Cleveland session of the American Medical Association, on June 14, the House of Delegates elected Dr. George G. Reinle of Oakland as vice-president of the national organization. Doctor Reinle's term as president of the California Medical Association came to an end at Riverside in May. Last month words of appreciation were

given in this column for his excellent services on behalf of organized medicine in our own State. It is pleasing to note this American Medical Association recognition of California, and of the merits of one of her sons. To Doctor Reinle, on the coming of this new honor, are extended the congratulations of his friends and fellow members in the California Medical Association.

THIS AND THAT

Ill-Advised Publicity.—When emotionally-biased persons group themselves into societies with high sounding preambles to elaborate the purposes of their organizations, the influence resulting from their propaganda is a something that not infrequently must be reckoned with. The members of some of these groups, such as the extreme antivivisectionists, at times are almost fanatical in the espousal of their programs. On that account scientific research is in constant danger, through legislative restrictions sponsored by anti-vivisection organizations. Therefore it behooves university authorities to be on guard, to prevent so-called research studies of a spectacular nature, which in lay press accounts become easily distorted. A recent case in point was that of an assistant at Berkeley, who, through so well known a news agency as the Associated Press, was referred to, on April 24, as a "research professor at the University of California," etc., etc. The photographs and description of his dog experiments were given widespread and repeated publicity, and in places did great harm to real scientific research. The fact that the individual in question had only a minor position in the chemistry department at the University of California was not exploited by the lay press, but the name of that great institution was, the publicity doing it, the State and scientific research, considerable harm. The individual in question was given an exit from the Berkeley campus, but that action, even though prompt, could hardly undo the damage of his ill-advised experimentation and its equally undesirable publicity. It might be stressed that this project was undertaken independently, under CWA support and funds, and was not submitted to or authorized by the research authorities of the University of California.

* * *

Alameda Health Insurance Exposé.—In the CALIFORNIA AND WESTERN MEDICINE for April, pages 262 and 317, considerable space was given to an account of the successful efforts of District Attorney Earl Warren of Alameda County, in sending some health insurance racketeers to the penitentiary. It is hoped that the good work inaugurated at Oakland will be seriously followed up in other counties of the State, and especially in counties having the larger cities, in which such pseudo-health insurance organizations seem to thrive.

These health racketeers are not the immediate offspring of our present-day economic conditions,

as some physicians are prone to think. The scheming brains in back of certain of these shrewd plans have been in operation in California for more than a quarter of a century.

During these years they were insidiously increasing in number and in malodorous endeavor, with such success in their profitable and grafting enterprises, that, like other bootlegging racketeers, they feared and stopped at nothing. County Society officers should keep in touch with their respective district attorneys, so that efforts to eliminate these make-believe health organizations may be successful.

The excerpt from the Twenty-Five Years Ago column to which reference was made follows:

"A New Shame.—And now comes 'The Pacific Coast Hospital Association,' 'A progressive modern enterprise that combines money-making with a great public benefaction.' The offices of the institution are in the Union Savings Bank Building, Oakland, and it seems to be presided over and generally managed by one McCullough Graydon. A booklet just received is most illuminating. The scheme, of course, is the same old 'dollar a month' medical-treatment-contract business." . . .

* * *

Malpractice Defense.—Another item printed in this official journal of the California Medical Association as long ago as June, 1909, was a discussion of the need of malpractice insurance, and the desirability of having the California Medical Association undertake steps to maintain such defense for its members. The excerpt reads as follows:

"Medical Defense.—Last year, at a meeting of the House of Delegates, a committee was appointed to investigate the question of the State Society undertaking the defense of its members in malpractice suits, and to report at the San Jose meeting . . ."

As a result of the above agitation, such a defense organization came into existence, and was maintained by the California Medical Association for some years, until lack of coöperation made it desirable to wind up its fiscal affairs. Some of its activities are still carried on under the name of the "Medical Society of the State of California," and members who desire information thereon can secure it by writing to the Association Secretary, Four Fifty Sutter Building, San Francisco. It is an enterprise worthy of support. It may be of interest to members of the California Medical Association who read State Senator Ralph E. Swing's article on "Malpractice—As an Attorney Sees It" (April CALIFORNIA AND WESTERN MEDICINE, page 221), that a request was received by the editor from one of the large insurance companies of America, asking permission to reprint that article, because of the excellent advice contained therein. It cannot be too often repeated that all physicians would do well to refrain from directly or indirectly criticizing the work of colleagues, until they were correctly informed of all the facts, including a full statement from the physician whose services are in question, because such statements have repeatedly laid the foundation for court actions. If you did not read Senator Swing's article, take the time to glance through it.

EDITORIAL COMMENT*

WHO SHOULD BE STERILIZED?

II†

The sterilization law under which we operate in California requires the superintendent to obtain the consent of the directors of the Department of Institutions and of the Department of Public Health. These officers request us to obtain the written consent of the next of kin. In requesting this permission from the relative, we state our reason for advising sterilization in the individual case. The patient and his relatives are not so much interested in the broad social problem, as in the effect on this particular patient. We are careful not to claim any curative effect, but stress the removal of possible causes of future attacks, and that we plan with women patients to correct any abnormal condition found when the abdomen is opened. In conjunction with sterilization, uterine tumors, diseased tubes, ovaries, and appendices are often removed, hernias are corrected, and other repair work done; and the promise of this work often persuades the hesitating relatives.

As we do not wish the decision left to the patient, we discuss it with him as little as possible. During a patient's stay in the hospital, before the question of sterilization is raised, we try to inspire his confidence in his physician, and then advise him that we consider an operation desirable before he goes home, very much as we would recommend that he should have his throat swabbed for tonsillitis. Usually this attitude is reassuring to the patient, and no objections are offered.

One woman spent almost all her hospital residence on the ward where these sterilized patients are cared for during the postoperative period, and thereby gained the viewpoint of the sterilized women. As her improvement progressed, she took the initiative in requesting sterilization. She explained that she had four children, had since had three abortions induced, and wished to go home and care for her children without the risk of future pregnancies, as she realized the dangers of sterilization were less than those of induced abortions.

It is very necessary that people be correctly informed about sterilization. In the past, due to over-enthusiasm, or misinformation, extravagant claims of improvement have been made. I had the opportunity to examine a group of the first patients sterilized in one hospital, and to review their records fifteen years after the operations were done. This group was composed of young male dementia praecox patients, and following the operation there were claims that they were quieter, less erotic, more compliant, etc.; but when re-

* This department of CALIFORNIA AND WESTERN MEDICINE presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to all members of the California and Nevada Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

† Part I of this paper appeared in the June CALIFORNIA AND WESTERN MEDICINE, page 429.

viewed fifteen years later they all showed gross deterioration, and there was nothing to distinguish them from their unsterilized mates.

Sterilization has been recommended as a remedy in the case of the sex offenses of the senile. These senile sexual acts are due to the mental condition, and there is no anatomical or physiological reason why sterilization should rejuvenate the mind, even though the operation has been advocated for sexual rejuvenation. If the operation should restore the sexual potency without restoring the mental potency, it is reasonable to expect more offenses of the same kind, rather than less.

It has been claimed that sterilized women would be more promiscuous, and that prostitution and venereal disease would be increased. Our follow-up work does not show such a result. The patients who were hypersexual before operation were still hypersexual after. In fact, all their reactions were much the same as before operation.

There has also been the fear that men would be more apt to commit rape if sterile. The punishments for rape are certainly more severe than for bastardy, and no one who has studied sex crimes would expect the inhibitions of a rapist to be influenced by the possible outcome months hence.

In one instance, our patient's wife complained that she was embarrassed by the husband proposing sexual relations to the wife's friends, and assuring them of their safety as he had been sterilized.

The question is occasionally asked, Might not one of these patients be the parent of a genius? There seems to be a wide divergence of opinion as to what actually constitutes a genius, but all will agree that a genius must be gifted with superior intelligence. In studies of a large group of superior high school and college students, it was found that the parents were also above the average intelligence level, and were sufficiently capable to provide a superior background for the children. Incidence of insanity in the ancestry of these gifted children is so low that the extremely small number of such parents who would be liable to be sterilized is negligible.

In the individual case we now rarely get objections from the better educated on grounds of religion. Some denominations still object as a general policy, but their ministers often assist us in getting the consent of the relations in individual cases. We still have to deal with those who claim we are depriving these patients of a God-given right to reproduce their kind or worse.

When deciding about sterilization, we ask ourselves these questions:

Will the patient's chances of relapse be increased by child-bearing or child-rearing?

Will the patient be able to provide proper environment and training for children?

Will the patient's children inherit his mental traits?

Our task is still one of education. We must combat the fallacy that sterilization is curative. We must clear up the confusion of sterilization as practiced, and castration, and distinguish the

different effects of the two, and we must convince that sterilization does not destroy sex desire or make men impotent.

Norwalk State Hospital.

M. J. ROWE,
Norwalk.

EPIDERMOPHYTOSIS

The problem of the clinical control of epidermophytosis, known to a layman as "athletic foot," is one of a tremendous interest, both from a theoretical and a practical point of view. Its practical importance is derived from its universal distribution in the adult population, reaching almost the size of a pandemic. The theoretical interest is due to its remarkable resistance to all external applications in many cases, and to a still more puzzling tendency to recurrences and acute flare-ups.

It is impossible to state with any degree of certainty whether cases of epidermophytosis, in its currently familiar manifestations, are actually on the increase numerically, or merely seem so because of the better understanding of it and more frequent recognition by the general profession. Personally, I believe that the latter is the case.

Theoretically, it is almost incomprehensible that a seemingly superficial fungus infection of the skin, which is so easily controlled and cleared up in many cases by mild antizymotic applications, resists any and all applications in apparently similar cases. No definite explanations of these facts, neither clinical nor experimental, have so far been advanced. One can plausibly look for explanation of this enigma to a hypothesis, apparently of speculative nature, yet confirmed by clinical experience. This is the assumption of variation in the susceptibility to fungus infection on the part of individual skins. This biologic weakness is expressed, clinically, both by the increased susceptibility to fungus infection, and also by a more protracted course of the infection and a weaker response to standard local applications. I am strongly in favor of this hypothesis. Only in this way can be explained the common observation that, in two apparently identical cases, one will clear up under a very small amount of routine local applications, while the other case will resist all of them or will show an uncontrollable tendency to recurrences.

It is my belief that the key to the therapeutic solution of the epidermophytosis problem lies not in the discovery of a new antizymotic drug. Many of the used drugs at present are sufficiently effective, as demonstrated both by clinical experience and bacteriologic experiments.¹

The data revealed in this report show a considerable discrepancy with clinical observations. While iodine, the one empirically undisputed supreme bactericidal and fungicidal agent, is given the first place on the list, other clinically established fungicides, such as salicylic acid, sulphur, benzoic acid and formaldehyd, are given a surprisingly low fungicidal quotient. Since the clinical test is the one final test in therapeutic deductions,

¹ Emmons: Fungicidal Action of Some Common Disinfectants on the Dermophytes, Arch. Derm. and Syph., 28:15 (July), 1933.

these laboratory findings can be accepted only with reservations.

Very recently an allegedly new specific local fungicidal drug, phenylmercuric nitrate, was offered as possessing a superior therapeutic value in tinea.² But my personal experience in a limited series of cases does not bear out the superior results claimed for it.

In my opinion, the clinical control of epidermophytosis cannot be obtained by local measures alone, in spite of the best technique, neither with fungicidal applications nor with actinotherapy, x-ray included. The systemic attention in the way of increasing the resistance of individual to mycotic infection should be supplemented. It can be attempted along immunologic lines, with injections of trichophytin in gradually increasing dosage.³

The results with the present status of technique are not conclusive. Furthermore, the procedure requires considerable competence and caution, as otherwise serious toxic reactions and damage may result. It seems, however, that the best results may be obtained ultimately from the attempts in this direction.

I believe, also, that other systemic correlated factors should be looked after, such as diet, particularly in regard to sugar reduction, and also hyperidrosis, palmar, plantar and axillar and inguinal, as these play a considerable part as a predisposing factor to fungus infection. The hygienic measures of individual and social nature should be integrated as an important link in the chain of the therapeutic measures of the clinical control of epidermophytosis.

1930 Wilshire Boulevard.

MOSES SCHOLTZ,
Los Angeles.

THE PHYSICIAN HIMSELF

I

On the occasion of a recent large medical gathering, the program consisted of a single address on "Medical Caricatures." And most entertaining it proved, too. But certain reflections, inspired by the subject and its presentation, seem much more serious than entertaining.

Why should medicine and the medical man so commonly be regarded as legitimate targets for the would-be-funny cartoonist and caricaturist? Is the explanation to be sought in the profession or in the individual physician? Undoubtedly the latter is the case, because the profession is judged solely by the members who compose it. The faults and foibles so often the themes of ridicule in lay publications, plays, and "movies," are practically always personified in some "Doc," or "Dr. Quack."

The individual physician—is he all that he might be for the furtherance of his own best interests, and for the dignity and public repute of his calling? What manner of man is the modern physician? The outstanding human value is character. Does he measure up from this viewpoint?

When the scientist investigates inanimate nature he reaches conclusions which may be expressed

only in imponderable terms and symbols. Likewise, when animate nature is analyzed, the ultimate phenomena of life and conduct are found to consist of elements and combinations of elements to which fanciful terms must be assigned. One of these terms is character. It is scarcely possible to segregate and define the subtle factors which enter into the concept of character, but everyone knows what they mean.

Integrity, conscience, morality, discretion, sobriety, charity, high purpose—not arrogance, conceit, greed, "four-flushing"—are some of the qualities the individual physician must manifest if the profession is to be protected from the ill-considered, often venomous, attacks of the caricaturist. Humor, real humor, is not objectionable when its intent is to evoke a healthy smile or teach a wholesome lesson. And in fairness it must be admitted that the thrusts of paragrapher and cartoonist do occasionally appear to spring from kindly motives.

In our capacity simply as men and women we may smile, or even guffaw, at the sallies, sometimes clever, sometimes merely coarse, of the caricaturist. But in our hearts we realize that they hurt, and that our profession should be beyond the possibility of such odious derision.

For long years the medical profession has been on the defensive. Acting through organizations it seems wholly unable to attain and maintain its rightful place in the confidence of the general public. "Education of the people," the idealistic slogan so long extolled as a panacea, seems impotent to meet the insidious propaganda of the designing and the vicious.

The issue is with the physician himself—his character and the impression he makes in his personal contacts. Nobility of character on the part of each member-unit is the only means by which the profession, as a whole, may hope to enjoy a position invulnerable to the shafts of ridicule, satire, and malice.

947 West Eighth Street.

A. B. COOKE,
Los Angeles.

SCARRING IN ACNE

Scarring, which becomes apparent after the cure of a case of acne, has been a question before the minds of physicians for many years. We are all familiar with the immense amount of damage done to the skin by severe cases, but we are often presented with the decision as to whether or not the scarring has been increased by x-ray therapy, or whether it has been decreased or not modified through this agency. The appearance of the scarring at the end of treatment has been the basis for many lawsuits which have been directed toward the innocent physician because the patients are dissatisfied with the appearance of their skin, and refuse to accept the fact that the scarring must necessarily be the result of the disease. The lack of understanding of this fact by a lay jury has often been the cause of an adverse decision directed toward the physician. The patient finds the scars to be apparent after the disease has

² Levine, B.: A. M. A. A., 101:2109, 1933.

³ Wise and Sultzberger, J. A. M. A., November 19, 1922.

healed and the inflammation has left the skin. Their attention has been so thoroughly centered on the swelling and pustulation of the disease that they have given no consideration to the fact that scars are being formed. These scars become noticeable after the swelling has gone. The physician and the x-ray treatment are blamed for this unfortunate condition.

Dr. Henry D. Niles of New York has published an article in the January, 1933, *Archives of Dermatology and Syphilology* in which he gives the record of forty cases which he treated in a manner to compare the effect of x-ray in the production of scarring with other methods of treatment of various types of acne. The summary of this article is as follows:

1. In forty patients who were given an average of twelve and one-half weekly exposures of one-fourth skin unit of roentgen rays on one side of the face, and a placebo treatment on the other, the scars were equal on both sides in thirty-two cases, more pronounced on the untreated side in five, and greater on the treated side in three.

2. The amount of scarring after acne vulgaris depends on the severity and duration of the eruption and the tendency of the patient's skin toward scar formation. This seems to be neither increased nor decreased by roentgen therapy.

3. In nineteen of the forty patients, the untreated side was either entirely cured or almost well, and as much improved as the treated side. Several theories as to the possible explanation of this unexpected finding are given.

The above series naturally will have to be added to considerably before we can make a proper statistical survey; however, they do definitely prove that we are certainly not damaging our patients through the use of proper x-ray therapy, and that it is probably preferable to other types of treatment in cases in which the damage to the skin is relatively severe.

407 Medico-Dental Building.

MERLIN T.-R. MAYNARD,
San Jose.

SALT SUBSTITUTION THERAPY IN ADDISON'S DISEASE

It has been demonstrated experimentally that a loss of sodium and chlorin particularly, as well as a negative balance for calcium, magnesium, potassium, phosphorus and nitrogen occurs in adrenalectomized animals.¹ Because of the loss of these basic elements, Rubin and Krick directed their treatment toward replacing them; and the improvement which followed was striking: untreated controls died in ten days, whereas rats receiving the salt mixture survived in apparent health for four months. These investigators believe it is probable that the action of the adrenal cortical hormone is primarily one of salt regulation. It is known, further, that sodium excretion is augmented in adrenalectomized animals.²

¹ Rubin, M. I., and Krick, E. T.: Effect of Adrenalectomy on Salt Metabolism in Rats, *Proc. Soc. Exper. Biol. and Med.*, 31:228, 1933.

² Loeb, R. F.: Effect of Sodium Chlorid in Treatment of a Patient with Addison's Disease, *Proc. Soc. Exper. Biol. and Med.*, 30:808, 1933. Loeb, R. F., Atchley, D. W., Gutman, E. B., and Jillson, R.: On the Mechanism of Sodium Depletion in Addison's Disease, *Proc. Soc. Exper. Biol. and Med.*, 31:130, 1933.

Loeb and co-workers² have observed a decrease in the sodium concentration of the blood serum in Addison's disease patients, and by diminishing the salt intake they have promptly induced symptoms of adrenal insufficiency. Administration of large amounts of sodium chlorid, on the other hand, brings about marked clinical improvement, which parallels the sodium level of the blood serum. Harrop et al.,³ and Rogoff⁴ appreciate this also, since Harrop suggested the use of a salt-free diet as a diagnostic measure. Rogoff has noted a "spectacular resuscitation from coma by intravenous saline solutions."

Our experience in maintaining an Addison's disease patient in apparent health, with sodium chlorid substitution therapy alone, confirms these observations. In this instance, the cost of cortical extract was excessive for this individual, so salt was prescribed. Eschatin had been given in recommended amounts over a four weeks' period, with some improvement, but the patient was not able to leave her bed. A salt-poor diet for a ten-day period aggravated the typical symptoms of Addison's disease. Blood (plasma) sodium chlorid was 508 milligram per cent before treatment (normal range 570 to 620 milligram per cent). Ten grams of table salt were given orally daily and eschatin was discontinued. Within ten days the patient was up daily, and in two weeks after onset of therapy she was able to care for herself entirely. She has since been well, except for ankle swelling which occurs when her blood salt level exceeds the normal range. Over a four months' period the blood (plasma) sodium chlorid content has ranged from 564 to 653 milligram per cent.

In our opinion, salt substitution therapy should be used in maintaining the normal level of sodium chlorid, as well as other elements found to be deficient in these individuals. It is probable also that the administration of sodium chlorid exerts some sparing action on other mineral metabolism. Since but approximately 10 per cent of the normal amount of adrenal cortical tissue is needed for life, and since glandular therapy is expensive and not entirely satisfactory when used alone, more attention should be paid to salt metabolism in Addison's disease. Increases in blood non-protein and urea nitrogen have been taken to indicate abnormal trends in adrenalectomized dogs.⁵ These tests might be used clinically, together with sodium chlorid determinations as guides for ascertaining whether salt substitution or glandular therapy is indicated.*

Department of Pharmacology,
University of California.

HAMILTON H. ANDERSON and
ALFRED C. REED,
San Francisco.

³ Harrop, G. A., Weinstein, A., Soffer, L. J., and Treacher, J. H.: The Diagnosis and Treatment of Addison's Disease, *J. A. M. A.*, 100:1850, 1933.

⁴ Rogoff, J. M.: Addison's Disease, *J. A. M. A.*, 99:1309, 1932.

⁵ Harrop, G. A., Pfiffner, J. J., Weinstein, A., and Swingle, W. W.: A Biological Method of Assay of the Adrenal Cortical Hormone, *Proc. Soc. Exper. Biol. and Med.*, 29:449, 1932.

* With technical assistance of Miss T. Blumberg.

STATE MEDICAL ASSOCIATIONS

This department contains official notices, reports of county society proceedings and other information having to do with the state associations and their component county societies. The copy for the department is edited by the state association secretaries, to whom communications for this department should be sent. Rosters of state association officers and committees and of component county societies and affiliated organizations, are printed in the directories noted under Miscellaneous, on the front cover index.

CALIFORNIA MEDICAL ASSOCIATION

CLARENCE G. TOLAND.....President
ROBERT A. PEERS.....President-Elect
EMMA W. POPE.....Secretary-Treasurer

COMPONENT COUNTY MEDICAL SOCIETIES

CONTRA COSTA COUNTY

The fourth meeting of the year of the Contra Costa County Medical Society was held on Tuesday evening, April 10, at the Hotel Carquinez, Richmond.

The meeting was turned over to Dr. Harry Ford, who served as chairman of the evening. He made remarks apropos of the especial qualifications of the two guest speakers who had kindly consented to come from San Francisco. The first subject was *Headaches—Demonstrable by Eye Examination* by Dr. Warren D. Horner. This was a most practical and helpful paper. The second paper was by Dr. Louis Morrison on *Foreign Bodies in the Bronchi, and Their Removal*.

Application for membership into the society was received from Dr. W. C. Monteverde of Pittsburg. Motion was made by Doctor Ford and seconded by Doctor Powell that he be accepted. The motion carried, unanimously.

Doctor Stauffer announced that the next meeting would be held on May 8 at Pittsburg.

The meeting was adjourned at 11:20 o'clock, after which the customary buffet luncheon was served.

The fifth meeting of the year, a midsummer dinner meeting, was held on Tuesday evening, May 8, at the Los Medanos Hotel, Pittsburg, and was attended by thirty-six members of the Contra Costa Society and of the Auxiliary.

Doctor Stauffer introduced Mrs. Fernandez of Pinole, president of the Auxiliary, and Mrs. Kerns and Mrs. Stauffer, who reported briefly upon the activities at the State Medical Association convention, as observed from the point of view of the Auxiliary.

Dr. Selby Marks, chairman of the evening, presented Dr. M. L. Tainter of Lane-Stanford Clinic. His subject was the all-absorbing topic of *Dinitrophenol*. His talk gave the experimental data of the long laboratory period, with the final conclusions relative to patients, and the results which may reasonably be expected from the use of that drug.

CLARA H. SPALDING, *Secretary*.

HUMBOLDT COUNTY

The Humboldt County Medical Society held its May meeting on the evening of the 17th at the Hotel Vance. Dinner, at which twenty-three members and two guests, Dr. Nathan Hale and Dr. Harold Zimmerman of Sacramento, were present preceded the meeting.

Dr. O. R. Myers presided. Doctors Stegeman and Myers reported the activities of the State Medical Association meeting; also that Doctor Myers had won the Golf Tournament.

Doctor Wallace made a report on the possibilities of Insurance for our local society. Doctor Norman made a report on Medical Jurisprudence as pertaining to the Association.

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The paper of the evening, given by Doctor Hale, on *Urological Problems*, followed, after which Doctor Hale also showed a 1000-foot film of South Sea pictures taken by him on a recent cruise.

The next meeting will be held on the afternoon and evening of June 21, and will be a joint meeting of the medical and dental societies. There will be golf in the afternoon. A 6:30 dinner will precede the evening meeting. The paper of the evening, by Dr. George W. Pierce of San Francisco, will be on *Reconstructive Surgery*.

LAWRENCE A. WING, *Secretary*.

MENDOCINO COUNTY

A regular meeting of the Mendocino County Medical Society was held at Ukiah on Wednesday, June 6, at 7 p. m., at the Saturday Afternoon Club House. Dr. Paul J. Bowman presiding. Before the regular program a joint dinner was held with the Woman's Auxiliary. Fourteen members of the Society and seven visitors were present.

Dr. William Voorsanger and Dr. Glenn Cushman of the Public Welfare League of California addressed the meeting on behalf of the Public Health League.

Following this it was agreed that a chapter of the Public Health League should be organized in Mendocino County. Dr. S. L. Rea was elected president, Dr. Paul J. Bowman, vice-president, and Dr. J. J. Kirwin, secretary.

The scientific program of the evening consisted of three reels of obstetrical films.

Upon the suggestion of Doctor Bowman, it was agreed that the next meeting would be held in Fort Bragg on some day in August.

RUDOLPH B. TOLLER, *Secretary*.

ORANGE COUNTY

The regular monthly meeting of the Orange County Medical Association was held at the James Café in Santa Ana at 7 p. m. The occasion was a dinner meeting honoring two charter members who are still members of the local organization. It also celebrated the forty-fifth anniversary of the Association.

The men so honored were Dr. C. D. Ball and Dr. J. P. Boyd. Doctor Violet acted as master of ceremonies, and in a brilliant speech paid suitable honor not only to these two men, but to the ladies of their families. Doctors Burlew, H. Johnston, and Maroon also paid tribute to these men.

Dr. Francis Findlay and Dr. C. Kohlenberger were unanimously elected to membership. The first reading of the application of Dr. Donald Abbott was heard.

Dr. C. D. Ball requested that the picture of the charter members, which now hangs in the attic of the library, be transferred to the Orange County Historical Society. On motion the request was granted.

Doctor Yeagle read a news item from the Santa Ana Register stating that Doctor Grover, D. C., was having a three-day clinic, and the chief chemist of the Mulford Company was to be present. The secretary was instructed to correspond with the Mulford Company to find out the details. The secretary read a communication from Gorden Bisel regarding a recent news item.

Dr. C. D. Ball read the obituary of Dr. Herbert Miller Robertson, who passed away on June 1. The

obituary was ordered filed with the minutes, and a copy sent to the State Association.

The scientific program of the evening was in charge of Dr. J. J. Montanaus, who presented a case of testicular tumor and demonstrated the autopsy findings.

WALDO S. WEHRLY, *Secretary*.

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SACRAMENTO COUNTY

A regular meeting of the Sacramento Society for Medical Improvement was held on the evening of April 17 at the Elks Temple. The president, Dr. O. F. Johnson, called the meeting to order at 8:30 o'clock. Ninety-two members were present.

The paper of the evening, *Angina Pectoris and Coronary Occlusion*, was read by Dr. Harold P. Hill, clinical professor of medicine at the University of Stanford Medical School.

In the course of his paper he brought out four important facts. First, he pointed out history as most important. Angina is not a disease, but a symptom. Angina pectoris is due to sclerosis of the coronary arteries, but the lack of pain in certain cases when there is extreme sclerosis of these arteries cannot be explained. He compared the pain of coronary occlusion with that of angina pectoris. Coronary occlusion pain, he pointed out, lasts longer than one-half hour. Sometimes this pain is abdominal in type.

The second important fact is examination. A distant first sound is occasionally found. Many cases, however, show no change in heart sounds. He explained that an increase in heart rate is more common than a decrease in coronary occlusion. An increase in heart rate is a bad prognosis. A drop in blood pressure is fairly constant in coronary occlusion. Eight to twenty-four hours later these cases run a temperature of 100 to 103 degrees, and have a leukocyte count 12,000 to 18,000. Pericardial friction rub, most often heard in the nipple line, is almost pathognomonic and lasts a short time.

The etiology is unknown. Factors that cause these diseases are:

1. Arteriosclerosis.
2. Worry and fatigue.
3. Physical strain.

Some interesting cases were related.

The treatment does not consist of medicine altogether, but

1. Bed rest (one month to three months).
2. Nitroglycerin, which controls the substernal type of pain.
3. Bromids.
4. Digitalis in failing compensation and falling blood pressure.
5. Morphin, one-quarter grain, every fifteen minutes until relieved.
6. Oxygen if cyanotic. Best used only in a tent.
7. Theobromin with luminal.
8. Caffein and strychnin are the best heart stimulants.
9. Atropin sometimes is a life-saver when there is edema of the lungs.
10. Adrenalin, about one-half cubic centimeter, whenever necessary.

Appreciation for the paper was voiced by Doctors Peers, Gundrum, Reardan, Lindsay, Pulford, Empey of Roseville, Bert Thomas, and Scribner.

Announcements of the state and northern district meetings were made.

Doctor Hale gave a talk urging that members of the Society support the Chamber of Commerce of Sacramento.

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A special meeting of the Sacramento Society for Medical Improvement was called to order by the president, Dr. Oscar F. Johnson, the evening of May 3 at the Elks Temple. Some 148 doctors were present, including many visiting physicians from northern California counties.

The paper of the evening, *Chronic Arthritis*, was delivered by Dr. Russell L. Cecil, associate professor of medicine at Cornell University. In his paper he discussed and differentiated osteo-arthritis and infectious arthritis. Doctor Cecil's paper was clearly illustrated by lantern slides. The paper closed with a discussion of the treatment which may be briefly outlined as follows:

A. Osteo-arthritis treatment:

1. Make patient rest.
2. Reduce weight. Low starch. Low sugars.
3. Thyroid if basal metabolism is low.
4. Massage. Not to be used in infectious forms.

B. Rheumatoid arthritis treatment:

1. Mild sluggish early form (duration, six months to one year).
 - (a) Remove foci of infection.
 - (b) Rest treatment, as in tuberculosis.
 - (c) Tonics (iron and arsenic).
 - (d) Vaccine. Streptococcus vaccine, 50,000 intravenously in one dose.
 - (e) Diet. Low starch and low carbohydrate. If patient is underweight, increase fat and protein. Vitamins A, B, C, and D.
 - (f) Baths and heat.
 - (g) Drugs. Gold thiocyanate may be good.
 - (h) Elimination.
2. Active febrile stage: Typhoid vaccine.
3. Well established and old form: Sanatorium care.

The paper was discussed generally, and many questions were graciously answered by Doctor Cecil.

FRANK W. LEE, *Secretary*.

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SAN JOAQUIN COUNTY

The regular monthly meeting of the San Joaquin County Medical Society was held in the Medico-Dental clubrooms on June 7. The meeting was called to order at 8:30 p. m. by Dr. P. B. Gallegos.

The applications for membership in the San Joaquin County Medical Society of Doctors G. C. Richardson of Sonora and E. W. Thomas of Stockton were read and referred to the Admissions Committee for their action.

Dr. Dewey Powell reported on a meeting held between the Public Relations Committee and a committee from the Woman's Auxiliary of the San Joaquin County Medical Society concerning the advisability of medical broadcasts. He stated that the Woman's Auxiliary wished to have a series of broadcasts in conjunction with the Parent-Teacher Association and the School Board, and requested that the society give the Public Relations Committee authority to formulate plans and work with the Woman's Auxiliary; and that these plans be presented to the Medical Society at the September meeting before any definite action is taken. The request was granted.

The scientific program of the evening was opened by Dr. William R. Rogers, who spoke on the *Surgical Treatment of Pulmonary Tuberculosis*. Doctor Rogers demonstrated several cases and illustrated his talk with x-ray pictures. The paper was discussed by Dr. T. C. O'Conner. The second paper of the evening was given by Dr. William Faber of San Francisco, who discussed *Recent Developments in Poliomyelitis*. This was discussed by Doctors Sippy, True, City Health Officer of Sacramento; Powell, County Health Officer of Contra Costa County; D. Powell, P. Dieffenbacher, S. F. Priestley, F. J. Doughty, Satour of Sacramento, Sanderson, Chapman, and Barnes.

Dr. Dewey Powell delivered a eulogy on Dr. L. R. Johnson. Dr. W. W. Fitzgerald also spoke on the death of Doctor Johnson, and moved that the society be adjourned in his honor.

The meeting was adjourned at 11:30 and refreshments were served.

G. H. ROHRBACHER, *Secretary*.

SANTA BARBARA COUNTY

The regular monthly meeting of the Santa Barbara County Medical Society was held on June 11 in the Bissell Auditorium of the Cottage Hospital.

This was a joint meeting of the County Medical Society and the Woman's Auxiliary of the County Medical Society.

The president, Doctor Markthaler, presided at the meeting and introduced the speaker of the evening, Dr. George Parrish, health officer of Los Angeles City. Doctor Parrish gave a most interesting talk on *The Conquest of Disease*.

At the conclusion of the meeting the ladies met in an adjoining room, and the county society went into executive session.

Doctor Gray reported for the Committee on Medical Economics and the Costs of Medical Care.

After discussion by various members of the society, it was moved, seconded and unanimously carried, that the report be adopted. Regarding the appointing of a governing board, it was moved, seconded and carried, that this same Committee on Medical Economics and the Costs of Medical Care be appointed the governing board, with power to administer the affairs of the Bureau, to review cases regularly, and to receive and dispense moneys incident to the operation of the Bureau; Doctor Gray to be chairman of the Board.

Doctor Markthaler reported that a new social worker had been obtained for the county dispensary.

It was moved, seconded and carried, that the county society take a vacation from regular meetings until September.

WILLIAM H. EATON, *Secretary*.

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SOLANO COUNTY

The regular monthly meeting of the Solano County Medical Society was held at the Hotel Casa de Vallejo on Tuesday evening, June 12, at eight o'clock.

This meeting was held jointly with the members of the Contra Costa County Medical Society. Forty-two members and guests of both societies attended. The meeting was preceded by a dinner.

Immediately following the dinner, Dr. William C. Voorsanger of San Francisco, president of the Public Health League of California, spoke on the functions and activities of this organization and strongly urged a 100 per cent membership in both counties.

Dr. Edward A. Peterson, city health officer in Vallejo, led a discussion on poliomyelitis. This topic was especially timely because of the fact that there are a number of suspicious cases of poliomyelitis in this section of the state. Doctor Peterson outlined the work that should be done in the event of any outbreak of the disease. His remarks were supplemented by Dr. Dwight Murray, city health officer of Napa, and by Dr. Harry Oliver of San Francisco.

The society went on record as wishing to cooperate 100 per cent with local and state health societies in the prevention of any outbreak of poliomyelitis. A committee, consisting of Dr. Edward A. Peterson (chairman), Commander C. W. Ross of the Mare Island Naval Hospital, Doctors Robert Dempsey, D. B. Park and A. J. Ryan of Vallejo, and Dr. S. G. Bransford of Suisun, was appointed on the problem of poliomyelitis to assist in stamping out any outbreak of this disease in Solano County.

Dr. P. B. Fry of Benicia, Solano County delegate to the State Medical Association convention at Riverside, gave a complete report, which was well received by the members.

The first speaker on the stated program of the evening was Dr. William C. Voorsanger of San Francisco, who spoke on *Tuberculosis in Children*. He stressed the early diagnosis and treatment of tuberculosis in youngsters, and illustrated his lecture with lantern slides.

Dr. Fred R. Fairchild, chief surgeon of the Woodland Clinic, presented the second paper of the evening, on *Appendicitis*. In his talk Doctor Fairchild gave a critical analysis of some one thousand cases of appendicitis at the Woodland Clinic, stressing the results

and clinical lessons learned from this vast number of cases. His talk was, likewise, supplemented by lantern slides of interesting facts and figures in connection with the critical analysis.

Following the delivery of these papers there was considerable discussion by the members.

Special guests of the evening were: Dr. James J. Hogan, retired physician in Vallejo and one of the oldest members of the Solano County Medical Society; Doctors Judson Sale, Victor Dillon, Harry Oliver and M. Wayburn of San Francisco, and Doctor Railsback of Woodland.

On Tuesday evening July 10, the members of the Solano and Napa County Medical Societies will hold a joint dinner meeting at the Napa Country Club. Doctors Edmund Butler and Howard Naffziger of San Francisco will be the guest speakers of the evening.

AMBROSE J. RYAN, *Secretary*.

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SONOMA COUNTY

The Sonoma County Medical Society held its June meeting at the El Camino Restaurant in Santa Rosa on the 14th. Thirty-five members were present.

Dr. W. E. Carter of the University of California Hospital told of the services offered to the medical profession of the state at that institution.

Dr. Howard Fleming of San Francisco gave an illustrated paper on the *Early Recognition of Cord and Brain Tumors*.

Dr. Alson R. Kilgore of San Francisco spoke upon the subject, *Things Confronting the Medical Profession*. It was a wonderfully fine program, and approved by all present. Considerable discussion followed.

Dr. D. J. Mahan of Santa Rosa was voted a retired membership in the society. A committee was appointed, with one representative in each town to keep the medical profession posted on the poliomyelitis situation.

W. C. SHIPLEY, *Secretary*.

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TULARE COUNTY

The Tulare County Medical Society held its monthly meeting at Motley's Café on May 20.

Dr. Charles M. Matthias of Tulare was unanimously elected to membership in the society.

Dr. Elmo Zumwalt, Tulare County Health Officer, brought up the subject of vaccination and diphtheria immunization for discussion. He reported the activities of the Tulare County Parent-Teacher Association in the diphtheria immunization campaign of 1933, and said that at the present time the Parent-Teacher associations have come to him to consider the feasibility of smallpox vaccination by a similar campaign method. Doctor Zumwalt asked for comment. General discussion followed by the members in attendance. Almost unanimous objection was raised against such a county-wide program of free public clinic vaccination.

Doctor Lipson made a motion that the society appoint a committee to confer with the city and county health officers to work out a plan for vaccination. This was seconded by Doctor Guido, and carried. Doctor Fowler appointed Doctors Lipson and Guido to report on this matter.

Dr. Frank Kohn made a report of his attendance as a delegate to the 1934 California Medical Association convention at Riverside. He gave an interesting account of the discussions in the House of Delegates and submitted the report of a proposed plan of hospital insurance.

Dr. Ray Rosson gave a brief report on a few of the scientific papers which interested him most, including one on *Industrial Back Injuries* and Chester Rowell's address on *Social Insurance*.

Dr. Edgar Brigham of Dinuba gave an interesting and instructive paper, illustrated by lantern slides, on *General Principles of Hydrotherapy*. He discussed methods of application and physiological effects of heat and cold applied to various parts of the body. It was followed by a general discussion, including some examples of the clinical application of hydrotherapy.

KARL F. WEISS, *Secretary*.

CHANGES IN MEMBERSHIP

New Members (39)

Alameda County.—Anah C. Wineberg.

Los Angeles County.—

Claire N. Brownsberger

Cyril B. Courville

Ralph G. Dryer

John O. Eiler

W. L. Halverson

P. F. Haskell

Sara M. Kiser

Romeo J. Lajoie

Neil H. Lewis

Donald S. MacKinnon

Samuel M. Marcus

William A. Marmor

Orvie D. McCartney

Fred C. Nichols

Paul Nilsson

Shigeichi Okami

John B. Peterson

Maurice N. Rosenberg

Yudell K. Slocum

Egberg C. Stratford

James E. Thompson

Orange County.—Francis M. Findley, Charles F. W. Kohlenberger.

San Bernardino County.—Harold R. Miller.

San Francisco County.—Elizabeth Arthurs, Alexander B. Bigler, Samuel F. Boyle, Marius A. Francoz, David O. Harrington, Albert L. Leveton, Carleton Mathewson, Jr., Clayton D. Mote, Newton H. Shapiro.

San Joaquin County.—Verne R. Ross.

Santa Clara County.—August Reich, Ethel Mae Shaull.

Siskiyou County.—James B. McGuire, Harry R. McVicker.

Transferred (7)

C. S. Ambrose, from Los Angeles County to Illinois.
Joseph W. Dasset, from Los Angeles County to Merced County.

Vincent P. Flynn, from Los Angeles County to Alameda County.

Richard B. McGovney, from Los Angeles County to Santa Barbara County.

H. C. Morrison, from Los Angeles County to Oklahoma.

Richard K. Pierce, from Los Angeles County to Alameda County.

George T. Pomeroy, from Los Angeles County to Napa County.

Resigned (1)

Arthur Perkins, from Alameda County.

In Memoriam

Conrad, Alexander Holland. Died at Val Verde, May 10, 1934, age 34. Graduate of the University of Michigan Medical School, Ann Arbor, 1932, and licensed in California the same year. Doctor Conrad was a member of the Riverside County Medical Society, the California Medical Association, and the American Medical Association.

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Holmes, Thomas Blakeney. Died at Oakland, May 12, 1934, age 68. Graduate of the University of California Medical School, 1894, and licensed in California the same year. Doctor Holmes was a member of the Alameda County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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Jacobs, William Roscoe. Died at Sacramento, May 20, 1934, age 48. Graduate of Cooper Medical College, San Francisco, 1910, and licensed in California in 1911. Doctor Jacobs was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✦

Johnson, Llewellyn Roberts. Died at San Francisco, May 26, 1934, age 52. Graduate of Cooper Medical College, San Francisco, 1903, and licensed in California the same year. Doctor Johnson was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Lockwood, Sheridan Alfred. Died at National City, May 29, 1934, age 60. Graduate of the American Medical Missionary College, Chicago, 1900. Licensed in California in 1901. Doctor Lockwood was a member of the San Diego County Medical Society, the California Medical Association, and the American Medical Association.

✦

Richards, Robert Lewis. Died at Montecito, May 26, 1934, age 65. Graduate of the Medical College of Ohio, 1894. Licensed in California in 1901. Doctor Richards was a member of the Santa Barbara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✦

Robertson, Herbert Miller. Died at Santa Ana, June 1, 1934, age 61. Graduate of Atlantic Medical College, Baltimore, 1897. Licensed in California in 1901. Doctor Robertson was a member of the Orange County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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Ryfkogel, Henry Anthon Lewis. Died at San Francisco, June 11, 1934, age 61. Graduate of the University of California Medical School, 1894, and licensed in California the same year. Doctor Ryfkogel was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

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Wagner, Carl Richard. Died at Pasadena, June 8, 1934. Graduate of Rush Medical College, Chicago, 1921. Licensed in California in 1927. Doctor Wagner was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

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Wallace, Edward Lee Roy. Died at Los Angeles, June 7, 1934, age 59. Graduate of the California Eclectic Medical College, Los Angeles, 1897, and licensed in California the same year. Doctor Wallace was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

OBITUARIES

Robert Lewis Richards
1869-1934

In the small hours of the morning of May 25, Robert Lewis Richards died in Los Angeles, in his sixty-fifth year.

Born at New Lexington, Ohio, December 10, 1869, the son of Dr. Alva and Katherine Huston Richards, he was educated at Delaware University and received his medical education at the Medical College of Ohio, in Cincinnati, graduating with the class of 1894. In 1900, he married Marie B. Hatton.

He soon interested himself in the study of neuro-psychiatry and worked extensively under such masters as Oppenheim in Berlin, Kraepelin in Munich, and Jung in Zurich. In 1902, he returned to enter the United States Army, induced by his interest in the psychiatric cases of the soldiers returning from the Philippines, and was the first officer to introduce psychiatry into the medical department of the United States Army at St. Elizabeth's Hospital in Washington, D. C. He later inaugurated the psychiatric service at San Francisco Presidio, and served in the Philippines and Cuba, resigning in 1912 to accept the superintendency of the Mendocino State Hospital where, during the late war, he again served, supervising the psychiatric service on the Pacific Coast and training members of the medical corps at Mendocino prior to their assignment to active duty.

From 1921 to 1930 he practiced privately in San Francisco and Oakland, in the latter year being appointed physician in charge and consultant to Mr.

Stanley McCormick in Santa Barbara, in which service his last illness overtook him. Interment will be at Arlington, Virginia, in the National Cemetery.

Doctor Richards was capable, honest, a gentleman. The medical profession of California has lost an outstanding member, the people, a valued servant.

WILLIAM H. STRIETMANN, M. D.

✦

Herbert Miller Robertson 1873-1934

Doctor Robertson, for many years in active practice in Santa Ana, after a lingering illness passed away on June 1, 1934. He was born in Glasgow, Scotland, April 22, 1873, and educated in the public schools of Manchester, England, and in the University of Glasgow, Scotland. He received his degree of doctor of medicine from the Southern Medical College, Baltimore, Maryland, in 1897, and engaged in a general practice in Detroit till 1901.

In 1894 he married Mary L. Baldwin; she and four daughters survive him.

He brought his family to Riverside that same year, and there remained until 1909, when Santa Ana became his home. While in Riverside he served as county physician four years, 1905-1909.

Doctor Robertson obtained his California license to practice in 1901. Shortly after coming to Santa Ana he was admitted to the Orange County Medical Association, of which he was president in 1930. He was a member of the California Medical Association and a Fellow of the American Medical Association.

During the Great War he served as examining physician on the Santa Ana Draft Board. On April 8, 1926, he was appointed on the Board of Medical Examiners for the State of California and reappointed in 1930, showing that his work there was fully appreciated. At one time he was president of the Southern California Homeopathic Medical Society.

With the passing of Doctor Robertson the profession lost a brilliant, energetic worker who will be greatly missed by his family and his many patients and friends.

C. D. BALL, M. D.

C. M. A. DEPARTMENT OF PUBLIC RELATIONS*

The Growth of Free Medical Care in San Diego Since 1920†

By J. TERRELL SCOTT, M. D.

San Diego County maintains the following principal divisions dealing in the treatment and prevention of disease:

1. County Hospital Main Building.
2. Vauclain Tuberculosis Sanitarium.
3. The Psychopathic Hospital.
4. The Neighborhood House, serving chiefly a Mexican population.
5. The Tuberculosis Dispensary.
6. The Venereal Clinic.

The first three divisions are under the supervision of the superintendent of the County Hospital; the other divisions are under the supervision of the Director of Public Health. In addition there are four permanent Child Hygiene Conference Centers in the Euclid, Fremont, Stockton, and Washington School Districts, supervised by the Director of Public Health; and there is the medical division of the City Police Department handling emergencies.

My purpose is to trace the growth of these institutions and to estimate the proportion of the population of the county being served by the free clinics of the county.

* An open forum for progress notes on the department's activities and for brief discussions on medical economics. Correspondence and suggestions invited. Address Walter M. Dickie, Room 2039, Four Fifty Sutter Street, San Francisco. This column is conducted by the Director of the Department.

† Read before the San Diego County Hospital staff May 22, 1934.

The most important division in the number of cases treated is the County Hospital, which handled in 1933 about 80 per cent of the people served by the county clinics. The statistics available for the out-patient department of the County Hospital are accurate back to the year 1921, and from the figures available for September, 1920, when 528 cases were treated, the number of cases treated in 1920 can be closely estimated. The admissions to the County Hospital, including Vauclain Home, are available back to 1924, when 3,564 admissions are reported. In December, 1920, there were 140 admissions from which the figures for the year 1920 may be estimated. The Psychopathic Hospital was added in the fiscal year 1926-27.

From this data the following figures are given, the year 1920 being estimated:

Fiscal Year	Hospital	Emergencies (e)	Out Patient Dept.*	Total Patients (e)
1920	2,000 (e)	1,100	8,000 (e)	4,900
1921	2,700 (e)	1,500	11,451	6,720
1924	3,564	2,500	14,253	8,750
1927	6,337	2,600	13,160	10,867
1930	7,206	3,800	26,731	16,582
1933	7,640	4,200	33,868	19,480
1934 (e)	8,000	4,400	34,000	19,944

e—estimated.

*—calendar year.

In estimating the total number of patients treated allowance has been made for cases treated in both the out-patient department and the hospital to avoid a duplication of figures—about one-third of the hospital cases come through the clinic. The emergency and clinic figures represent treatments and not patients and these figures have been divided by three, as it is estimated that the average number of calls per patient is around three. We note that the increase in the number of hospital cases has been held down since 1930, and the patients shifted to the out-patient department.

The County Venereal Clinic was started in 1919. In 1933 there were 1,059 new cases treated and 1,610 persons were treated in all. There were 5,721 treatments given—an average of over twenty a day. This clinic has increased enormously since 1923 when approximately one-fifth as many cases were treated. There were 219 new cases in 1923 compared with 1,059 in 1933.

Immunization was started by the Health Department in 1926, and in the following six years the Department did 20,000 immunizations. In 1932, 5,900 immunizations were accomplished.

Neighborhood House was started in 1912, and reports the following cases treated for 1932:

Gynecology cases	821
Sick babies	1,454
Prenatal clinic cases	292
First aid treatments	1,204
Emergency visits	1,285
Tonsillectomies	105

Total cases 5,161

Assuming that the average patient will call three times during the illness, this represents a health service to approximately 1,700 individuals. One-half of the persons served have been Mexican and negro.

The Tuberculosis Dispensary was started in 1908. The number of cases treated has shown a marked increase during the past four years—estimated at close to 100 per cent. According to the nurse in charge, the number of cases now being treated is about the same as last year, and has shown no noticeable increase for the past four months. In 1932, 1,863 individuals attended the clinic, of whom 1,536 were examined, 933 were referred to the County Hospital and 89 children were sent to the children's preventorium. The number of cases seen who were not sent to the County Hospital was 930.

The estimated number of individuals treated by these three divisions of the Public Health Department is as follows—the 1932 figures are closely estimated, the 1920 and 1934 figures are roughly estimated:

	1920	1932	1934
Venereal clinic	250	1,610	1,800
Neighborhood house	500	1,700	1,900
Tuberculosis dispensary (not referred to county hospital)	350	930	950
Total	1,100	4,240	4,650

The estimated number of individuals served by both the County Hospital and the Public Health Department may now be combined and the following table presented—an estimate sufficiently accurate for the purpose of comparison, even though the fiscal year for the County Hospital ends June 30 while the statistics from the health department are for the calendar year.

ESTIMATED NUMBER OF INDIVIDUALS TREATED

	County Hospital	Health Department	Total*
1920	4,900	1,100	5,890
1924	6,720	1,800	8,340
1927	10,867	2,600	13,207
1930	16,582	3,450	19,687
1934	19,944	4,650	24,125

* After deducting 10 per cent from Health Department figures to allow for duplication.

The population of San Diego County in 1920 was 112,282, and by 1930 the population had increased 95 per cent to 209,659. According to the statisticians of the San Diego Consolidated Gas and Electric Company, there has been no noticeable increase in the population since 1930. However, from 1930 to 1934 the average daily attendance at the city schools of San Diego increased from 22,373 to 25,470 or 14 per cent. The population of the city of San Diego for 1930 was 147,995 and the population of the adjoining cities of Coronado, La Mesa, National City, Chula Vista and El Cajon was 20,158, giving Metropolitan San Diego a population of 168,153 compared to 83,957 in 1920, an increase of 100 per cent. The estimated population for 1934 is 190,000.

NUMBER OF NAVAL DEPENDENTS

What proportion of the civilian population of Metropolitan San Diego are naval dependents? This is a difficult question to answer, and only an approximation of the number of naval dependents residing in San Diego can be given. The following estimates were obtained from the Eleventh Naval District Commandant's office, from the clerk of the Commissary Store, from the head of the out-patient department of the United States Naval Hospital, and from the San Diego Chamber of Commerce. There were on January 1, 1934, 20,000 enlisted men in the Navy stationed in San Diego, two-thirds of whom are stationed on boats in the harbor. Probably 25 per cent of these men are married and have their families residing in San Diego. Assuming such to be the case, and an average of 3.3 individuals per family, this would mean 16,500 people. In addition there are over one thousand retired naval men with families, representing about 3,500 people. These, together with 15,000 unmarried men, represent a population of 35,000. The commissary department estimates from the number of requisition cards issued, a population of 30,000. It is thought that over 3,000 homes and apartments are rented by navy men in San Diego proper. It is safe to conclude that at least 20,000 civilians residing in San Diego are naval dependents, or are dependents of navy men now retired. These residents are included in the 1930 census figures but are taken care of by the United States Naval Hospital and the Navy physicians. Subtracting these figures from the population of Metropolitan San Diego will leave a civilian population of 170,000 who are cared for by the county and the private physicians. It is difficult to arrive at a corresponding figure for 1920. However, the active personnel of the Navy on Shore Duty in the San Diego district for 1923 is given as 3,646, compared to 6,300 January 1, 1934. The active personnel was probably around 7,500 men in 1920, or approximately 40 per cent of the present number.

For the purpose of comparison we may estimate roughly that the number of naval dependents residing in San Diego in 1920 was about 8,500, which, subtracted from the 1920 population, will leave a population of about 75,500 civilians cared for by the county and the private physicians.

THE NORMAL INCIDENCE OF SICKNESS

What is the incidence of sickness in the average community? How many are sick at a given time and

how many will be sick during the year? According to the studies of the Committee on the Cost of Medical Care, 2 per cent of the population are sick all the time, and the average illness lasts 8.3 days. (Peebles '29.) Sydenstricker made a survey of illness for the town of Hagerstown, Maryland, in 1921. According to his report, 3.2 per cent of the wealthy and 4 per cent of the poor were ill during the month of December, 1921, out of 1,800 households. For the three years 1921, 1922 and 1923, there was an average of 5,740 cases of illness of three days or more duration among a population of 29,000. This represents 20 per cent of the population. If all illnesses of one or more days are taken, probably 25 per cent of the population would be affected.

Assuming such to be the case, the number of people being cared for medically by San Diego County represents 25 per cent of those eligible. The following figures show the estimated number of people who, when ill, will attend the county clinics, from Metropolitan San Diego and the ratio this leaves to the civilian population other than naval dependents.

Year	Total Cases Treated (25% of those eligible)	No. of Residents Eligible from Metropolitan San Diego*	Population of Metropolitan San Diego (other than naval)	Percent Having Free Medical Care
1920	5,890	22,380	75,500	30%
1924	8,340	31,700	125,000	40%
1927	13,207	50,200	148,153	50%
1930	19,687	74,600	170,000	54%
1934	24,129	91,670		

* Five per cent has been deducted for the population served for outlying districts of the county.

In 1920 it is estimated that 30 per cent of the population of Metropolitan San Diego, other than naval, was being served by the county clinics, 7½ per cent of the population being actually treated for illness. By 1934 it is estimated that 54 per cent of the population is being served by the county.

CLINICS OTHER THAN COUNTY CLINICS

Mercy Hospital, which is the largest private hospital in the county, started a part-pay clinic in January, 1933. A charge of 50 cents is made per visit, the hospital retaining one-half. For the year 1933 there were 456 visits to the clinic made by approximately 150 individuals. The Mercy Hospital Clinic, which is practically a charity clinic, is thus drawing from about 600 residents.

The Central Clinic was started in January, 1933. It is not a treatment clinic, but a central bureau for social service investigation and for referring patients to the private physicians, the hospitals and the clinics with recommendations as to fees. For the year 1933 the Central Clinic referred 617 cases to physicians on a part or full pay basis.

If we estimate that these patients pay an average of 50 per cent of the full fee, then this plan would be equivalent to a loss of 308 cases by the private physicians of the county drawing from 1,234 people.

NUMBER OF PEOPLE PER PHYSICIAN IN PRIVATE PRACTICE

The number of registered physicians in San Diego County in 1921 was 251. In 1925, 296, and in January, 1934, 402. The estimated number of physicians for 1920 is 240. At the present time 11 per cent of all registered physicians are residing in the outlying districts, and 89 per cent in the metropolitan district. Assuming these proportions to have held in 1920, we have:

Year	Registered Physicians in Metropolitan San Diego	Residents not Eligible to County or Federal Aid	Residents Per Physician
1920	216	53,100	246
1934	376	78,330	200*

* After deduction of 600 on account of Mercy Hospital Clinic, and 2,500 representing those served by the Central Clinic.

The classification of the people in Metropolitan San Diego, according to the medical service received,

or rather their eligibility for receiving such service, may now be estimated as follows:

	1920	1934
Served by County Hospital and Public Health Department (of whom 18,640 were receiving county and state aid January 20, 1934).....	25.5% 22,400	92,000 46. %
Resident naval personnel including dependents.....	10. % 8,500	20,000 10. %
Non-resident naval personnel (floating).....	4.5% 4,000	10,000 5. %
Served by Central Clinic.....		2,500 1.2%
Served by Mercy Hospital Clinic.....		600 .3%
Served by private physicians on full-fee basis.....	60. % 53,100	75,000 37.5%
Total	100. % 88,000	200,100 100. %

CONCLUSIONS

1. The resident population of Metropolitan San Diego has increased from 1920 to 1934 from 84,000 to 190,000 (126 per cent).
2. The number of registered physicians in the same period has increased from 216 to 376 (75 per cent).
3. The number of residents cared for by the county has increased within the same period from 22,000 to 92,000 (420 per cent); these figures being an estimate.
4. As a result of this enormous increase of free medical care by the county, the per cent of the total population supporting the private physicians has declined in the past fourteen years from 60 per cent to 38½ per cent.
5. Most of the increase in the use of free county clinics has occurred before the present economic depression—the rate of increase has been less since the depression than it was preceding the depression.

SOURCES OF INFORMATION

Report of the superintendent of the San Diego Hospital, 1933.

The files of the San Diego County Hospital outpatient department.

Annual report of Public Health Department of San Diego, 1932.

Sydenstricker, "The Extent of Medical and Hospital Service in a Typical Small City," Public Health Reports, Vol. XLII, No. 2.

Sydenstricker, "Economic Status and the Incidence of Illness," quoted in *Monthly Review*, November, 1929.

Commandant's Office, Eleventh Naval District.

San Diego city schools—superintendent's office.

San Diego County Welfare Commission.

—*Bulletin of the San Diego County Medical Society*, June 1, 1934.

THE WOMAN'S AUXILIARY TO THE CALIFORNIA MEDICAL ASSOCIATION*

MRS. PHILIP SCHUYLER DOANEPresident
MRS. ELMER BELT.....Editor and Chairman of Publicity

The Annual Election.—For the year 1934-1935 the officers and directors of the Woman's Auxiliary to the California Medical Association elected at the annual convention held at Riverside this May are: President, Mrs. Philip Schuyler Doane of Pasadena; president-elect, Mrs. Thomas J. Clark of Oakland; first vice-

* As county auxiliaries to the Woman's Auxiliary to the California Medical Association are formed, the names of their officers should be forwarded to Mrs. A. Elmer Belt, chairman of the Publicity and Publications Committee, 2200 Live Oak Drive, Los Angeles. Brief reports of county auxiliary meetings will be welcomed by Mrs. Belt and must be sent to her before publication takes place in this column. For lists of state and county officers, see advertising page 6. The Council of the California Medical Association has instructed the editor to allocate one page in every issue for Woman's Auxiliary notes.

president, Mrs. William H. Sargent of Oakland; second vice-president, Mrs. Charles E. Howard of San Diego; recording secretary, Mrs. H. E. Henderson of Santa Barbara; corresponding secretary, Mrs. H. Waldo Spiers of Los Angeles; treasurer, Mrs. Frederick N. Scatena of Sacramento.

Mrs. John V. Barrow of Los Angeles, Mrs. Frank Baxter and Mrs. Robert T. Sutherland, both of Oakland, and Mrs. Arthur W. Walker of Riverside are the four councilors-at-large, and Mrs. William H. Newman of San Diego, Mrs. Elmer Belt of Los Angeles, Mrs. Charles Stevens of Santa Barbara, Mrs. Percy B. Gallegos of Stockton, Mrs. U. S. Abbott of Richmond, Mrs. J. Howard Hall of Sacramento, and Mrs. Raymond Babcock of Willits are the seven district councilors.

* * *

Helen Doane Membership Trophy.—At the luncheon given in her honor in the patio of the Mission Inn on the closing day of the convention the incoming president, Mrs. Philip Schuyler Doane, presented to the State Auxiliary a fine, silver trophy in the form of a large vase. This is to be awarded annually to the county auxiliary making the greatest pro rata gain in membership during the year. To Santa Barbara County goes the honor of the first victory and to Mrs. John Van Paing, its presiding officer, the trophy was given to have and to hold until next May. At the 1935 convention, which is to be in Yosemite, membership lists will again be tallied and the award made.

* * *

New State President Honored.—Not only the members from the far corners of her own county, but those from three other counties as well, came to the Midwick Country Club on a fine May day, the 22nd, to the celebration in honor of Mrs. Philip Schuyler Doane, president of the Woman's Auxiliary to the California Medical Association. Mrs. Doane's own city, Pasadena, and its near neighbor, South Pasadena, were hostesses for the day, with Mrs. Harry Markoff in charge of arrangements. Mrs. John V. Barrow, the Los Angeles County president, presided at the speaker's table, and had invited for the occasion the presidents of the outstanding women's organizations of the city.

The dining room and all the adjacent sun rooms of the Midwick were filled with tables and merry guests for the luncheon. Mrs. Barrow presided with friendly dignity, and in a clear-cut speech outlined the aims of the Auxiliary for the benefit of the many new guests there, and then introduced them and the officers to the assembled members. Mrs. Louise Ward Watkins spoke with clarity and force upon some pressing civic problems. Mrs. B. S. Lewis told of her impressions of this, her first, contact with our organization and of our president's "million-dollar" personality. Mrs. F. E. Coulter, long a close friend and co-worker, paid a fine, warm tribute to "Helen Doane of Pasadena." Mrs. James F. Percy lighted up the past with a few minutes on the perils of pioneering days in the Auxiliary, and predicted a promising future under Mrs. Doane's leadership. Two of the Auxiliary daughters made a bow, Miss Mildred Schwuchow, whose harp selections added so much enjoyment to the program, and Dolly Doane Hubbard, the lovely daughter of the president, who describes her as her chief accomplishment. Among the messages of greetings and congratulations was a telegram from the state treasurer, Mrs. Frederick N. Scatena of Sacramento. Mrs. Barrow called last upon the guest of honor, who stood through a cheering burst of applause before she could be heard in her sparkling and apt replies to the tributes paid her.

In the afternoon there were cards, conversation and conferences in the clubhouse, and swimming outdoors in the big, blue pool. As the guests left they wished Mrs. Doane and her fellow traveler, Mrs. Percy, a happy trip to the National Auxiliary, which convenes with the American Medical Association at Cleveland

in June. The entire membership looks forward with interest to the report of the convention upon their return.

* * *

Kern County Organized.—It is a real pleasure to announce the formation of a new unit, the Woman's Auxiliary to the Kern County Medical Society. Mrs. N. N. Brown of Bakersfield, widely known and greatly loved, was responsible for bringing together the fifteen charter members who compose this, the eleventh and youngest of our county societies. President Doane and Past President Coulter made the trip to Bakersfield the last of May and properly initiated the new pledges. The Kern County group have already given proof of their worth in a fine, constructive piece of work concerning their county hospital bonds, a detailed report of which will appear, we hope, in a later issue. We welcome you, Kern County, and wish you well.

* * *

Component County Auxiliaries *

Contra Costa County.—The May meeting of the Woman's Auxiliary to the Contra Costa County Medical Society was a joint meeting with the medical society in the form of a dinner at the Las Medanas Hotel in Pittsburg. Mesdames Manuel Fernandez, Melvin Stauffer, and C. L. Kerns gave interesting and enlightening reports of the state convention in Riverside. After these Dr. Melvin Stauffer introduced Doctor Tainter of Stanford University, who gave a very instructive and comprehensive treatise on the drug alpha dinitrophenol. HELEN WEIL, *Secretary*.

* * *

Los Angeles County.—At the suggestion of the Public Health League, the Los Angeles County Auxiliary is carrying out two projects which, it is believed, will be of help in contests concerning medical legislation. The first is the division of all the doctors of this county into their assembly districts so that when need arises the informed opinion of the profession on measures vitally affecting public health and welfare can be made known to the elected legislators from these districts. This work is already complete due to the energetic efforts of Mrs. Ferris W. Thompson and her committee. The second project, made more simple because of the listing just done, is the telephoning of every doctor's home and office to urge the registration of each eligible voter there.

The Huntington Park members were hostesses at a delightful tea at the home of Mrs. Owen Moore last month, and at that time the necessity of a clear understanding of the narcotic situation in the state, especially in reference to the Harrison Drug Act, was put forward by Mrs. James F. Percy.

Ever since the busy days of Red Cross work in 1917 a small group, headed by Mrs. Herman Zeiler and Mrs. Philip Stevens, has devoted an afternoon a month in sewing for one of the day nurseries here. Because many of our members are interested, it was agreed to form a sewing unit, limited to them, and to continue this welfare work under the Auxiliary's sponsorship. These informal gatherings are held in the homes and limited to fifteen. If the desire grows, other units are to be formed among friends who enjoy an afternoon of congenial work together and in serving a good cause.

Our president, Mrs. John V. Barrow, reports that the campaign for collecting cod-liver oil samples was surprisingly successful, and that these are being distributed among needy children through the Parent-Teacher Association and, also, that the *Hygeia* subscriptions of our county have now topped the quota for the entire state.

The regular May meeting, the luncheon honoring Mrs. Doane, is reported elsewhere in this issue.

MRS. ELMER BELT, *Corresponding Secretary*.

Orange County.—The Auxiliary to the Orange County Medical Association met Tuesday afternoon, June 5, at the Pacific Coast Club, in Long Beach, as guests of Mesdames D. C. Cowles, Claude Steen, E. J. Steen, and Ray Green of Fullerton and C. G. Curtiss of Brea.

During the business session preceding the program of the afternoon, the following correspondence was read which had to do with subjects of special interest at this particular time. A letter from Mr. Ben Read urged that we, as an organization, see that all doctors of our community and those of their families that are eligible be registered to vote. A letter from our state president was read asking us to cooperate in this matter and suggesting that a committee be formed for this purpose. Mrs. Ray Green, chairman of the Committee on Public Relations, read a letter from Dr. K. H. Sutherland of the County Health Department giving us a report on the poliomyelitis situation in Orange County. In his report Doctor Sutherland included the substance of a recent bulletin from the State Board of Health telling of a prophylactic treatment for poliomyelitis suggested by Dr. William H. Park of the New York City Health Department, an authority on poliomyelitis.

Mrs. D. R. Ball, program chairman, introduced as speaker of the afternoon Dr. Fred B. Clark, chairman of the Committee on Health and Public Instruction of the California State Medical Association. He gave a most interesting and instructive talk on *Compulsory Health Insurance*. Doctor Clark explained the situation which makes necessary some form of health insurance. He told of the Senate committee formed to find a solution for the cost of medical care, which is too high for the great majority. Doctor Clark emphasized the difficulty, and also the importance of keeping the matter out of politics.

On conclusion of the business session and program, the members were entertained during the tea hour by a delightful musical program.

ELIZABETH M. SUTHERLAND, *Secretary*.

* * *

Sacramento County.—The regular meeting of the Woman's Auxiliary to the Sacramento Society for Medical Improvement was held the third Tuesday in May, the 15th. As this was the last meeting of the year, it was largely social and was in the form of a bridge luncheon. A very short business meeting was held, with the president, Mrs. Howard Hall, presiding. Mrs. A. M. Henderson, past state president, Mrs. F. M. Scatena, state treasurer, and Mrs. Junius B. Harris, local delegate, all gave reports of the state convention at Riverside. Luncheon was served at a new tea room about seven miles out of Sacramento, at Sommerville, where the food is excellent and the garden lovely with flowers. About forty members were present and remained to play bridge afterward.

At the state convention Mrs. Scatena, Mrs. J. B. Harris, and Mrs. J. Ray Jones were elected as state delegates to attend the national convention in Cleveland, June 11 to 15, 1934. At this writing all have left for the convention.

MRS. FRANK P. BRENDEN,
Corresponding Secretary.

* * *

San Diego County.—The San Diego branch of the Woman's Auxiliary, in place of the usual luncheon and program, gave, in June, two benefit bridge parties for the fund for the crippled children's pool. These were held on June 5 at 1 p. m. and at 7 p. m. at the home of Mrs. E. H. Crabtree, 3465 Hawk Street. Dessert was served, and games of bridge enjoyed by the large number of guests, the usual door and table prizes given. Mrs. Charles E. Howard and her social committee were in charge. A substantial sum was realized to add to the amount already pledged to the pool.

MRS. J. C. ELLIOT KING,
Publicity Chairman.

NEVADA STATE MEDICAL ASSOCIATION

D. A. SMITH, Mina President
 E. E. HAMER, Carson City President-Elect
 J. N. VAN METER, Las Vegas First Vice-President
 W. H. FROLICH, East Ely Second Vice-President
 HORACE J. BROWN, Reno Secretary-Treasurer

COMPONENT COUNTY MEDICAL SOCIETIES WASHOE COUNTY

The regular monthly meeting of the Washoe County Medical Society was held in the Nevada State Building on June 15.

The preliminary routine business of the society was disposed of, and Dr. Erwin J. Hund was called upon to present his paper. His essay was on *Differential Diagnosis and Coronary Thrombosis and Occlusion*.

In substance, Doctor Hund said: "The sudden intense, prolonged pain is usually present in thrombosis. Contrary to the pain of angina, thrombosis pain comes on during rest rather than after exertion. Thrombosis is facilitated by decreased velocity in the blood stream with lowered pressure. Pathologic changes are present in the vessel walls, likewise changes both chemical and cytological in the blood constituents. The type of pain is often similar to angina, but of greater intensity and greater duration and greater prostration. The pain remains unabated from many hours to many days in contradistinction to the short duration of angina. The pain may be epigastric, similar to the pain of duodenal rupture. In thrombosis there is great shock. There is no condition where shock, if present, is more pronounced. The next symptom observed in thrombosis is the fallen blood pressure. If the case was 250 milligrams of pressure, it may drop to 150 milligrams. It is highly necessary in this instance to make the diagnosis between thrombosis and angina. Dyspnea is one of the outstanding symptoms of thrombosis. The cause of dyspnea is believed to be due to the low velocity with which blood is pumped through the lungs, and the damage is usually to the (right?) side of the heart. In line with thrombosis we may have cyanosis, pulmonary edema, albuminuria, and subcutaneous edema, which assist in establishing the diagnosis. In addition to the above, there are three cardinal findings to corroborate the above diagnosis: They are the heart sounds, remarkable in their feebleness and at times apparently absent. This enfeeblement is due to pericardial involvement with myocardial weakness. In this type of attack, if seen early, fever is always present, but usually of slight degree. The fever results from infarction and necrosis of the thrombus. As fibrosis takes place the fever declines. The physician will find that here it is highly important to have a count made of the leukocytes to determine the increase of the polymorphonuclears. They may run from 10,000 to 25,000, and the average is 15,000. A return to normal count and a lengthening period of complete rest should be insisted upon by the physician before any form of activity is undertaken by the patient.

"The third symptom is shock. For the treatment in the stage of pain, together with heart-block and anoxemia, digitalis and nitroglycerin are not indicated, but rather the hypodermic use of liberal quantities of morphin up to the point of narcosis. Oral administration is worthless. Sometimes the pain is so terrific that the patient feels like tearing himself to pieces. For the shock, heat is par excellent, but be careful to elevate the patient rather than to lower the head. The patient will, himself, insist upon the upright position. If stimulation is to be desired, caffeine is the drug of choice, given by hypodermic.

"In the intermediate stage, gastro-intestinal symptoms peculiar to thrombosis, and which is not relieved by vomiting, is the major complaint. For the relief of

this condition, alcohol in its many forms is valuable. Painful eructations is usually relieved by carbonated water."

In conclusion, Doctor Hund suggested that in the future care of the patient nitroglycerin and digitalis were not indicated, but such type of medication as coupled with mental and physical rest that circumstances would indicate.

Doctor Hund's paper was followed by a paper on *Therapy in Heart Conditions* by Dr. George L. Servoss. In a very excellent review of all the standard medications usually given in heart affections, he also outlined the rôle of the newer agents that are coming into popularity today.

THOMAS W. BATH, Secretary.

Federal Aid in Mosquito Abatement.—It would appear that there is a possibility for communities in California to carry on, under the Federal Emergency Relief Administration, certain mosquito control activities in connection with the control not only of malaria-carrying mosquitoes but also salt-marsh mosquitoes and other pestiferous mosquitoes. Funds obtained for this purpose can be expended only for labor. Since the principal cost in mosquito control work is that connected with labor, the distribution of funds from this source would care for the chief item of expense in mosquito control work.

Surgeon General H. S. Cumming, of the United States Public Health Service, has requested the director of the California State Department of Public Health to submit an itemized list of possible mosquito control projects in California, together with the estimated cost, for transmission to the Director of Work Relief Projects.

Following is the text of a communication from Hugh R. O'Donnell, Director of Work Relief Projects of the Federal Relief Administration, to the Surgeon General:

"As you probably know, this administration is trying to put as many men to work as possible and is paying them out of funds provided partly by the government and partly by the states.

"We would like to hear from you on this subject and if you can submit any work projects for which no appropriations have been made available we should like to go further into the matter with you."

Mental Symptoms Associated with Cerebral Tumor.—Minski studied the mental symptoms in fifty-eight cases of cerebral tumor and made an attempt to assess their value, if any, in the localization of the tumors. Concurrently with these symptoms, the presence or absence of physical signs was noted with a view to helping in localization. He concludes that mental symptoms in cerebral tumor do not appear to depend on localization, but rather on the rate of growth of the tumor and the previous personality of the patient. Mental symptoms occur more commonly with cerebral tumors (more with left-sided than right-sided ones), as, of the fifty-eight examined, forty-nine were cerebral and only five subtentorial. All the former and only one of the latter showed mental symptoms. In slow-growing tumors personality changes predominate, the mood depending on the release of preformed tendencies. In this series, fourteen of the fifty-eight patients examined were depressive and seven manic. In rapidly growing tumors, changes in the intellectual sphere are marked and personality changes slight, while in the more rapidly growing tumors intellectual disturbances with clouded consciousness are found. In the former group were twenty-three, and in the latter six. Twenty-five patients showed reactions simulating functional psychoses, and in twelve of these physical signs were absent. Physical signs are less common in patients admitted to a hospital caring for the mentally deranged patient than in patients admitted to a neurologic hospital, while aphasia is commoner in patients seen in the former.—*Journal of Neurology and Psychology*.

MISCELLANY

Under this department are ordinarily grouped: News; Medical Economics; Correspondence; Twenty-five Years Ago column; Department of Public Health; California Board of Medical Examiners; and other columns as occasion may warrant. Items for the News column must be furnished by the fifteenth of the preceding month. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Coming Meetings

American Congress of Physical Therapy, Philadelphia, September 10-13. Mr. Marion G. Smith, 30 North Michigan Avenue, Chicago, Secretary.

American Ophthalmological Society, Lucerne-in-Quebec, Canada, July 9-11. Dr. J. Milton Griscom, 2213 Walnut Street, Philadelphia, Secretary.

New Mexico Medical Society, Las Vegas, July 19-21. Dr. L. B. Cohenour, 219 West Central Avenue, Albuquerque, Secretary.

Pacific Coast Oto-Ophthalmological Society, Butte, Montana, July 16-18. Dr. F. C. Cordes, Fitzhugh Building, San Francisco, Secretary.

Medical Broadcasts*

American Medical Association Health Talks.—The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time.

San Francisco County Medical Society.—The San Francisco County Medical Society broadcasts every Tuesday from station KJBS, 11:15 a. m., and over station KFRC, 1:15 p. m.

Los Angeles County Medical Association.—The radio broadcast program for the Los Angeles County Medical Association for the month of July is as follows: Tuesday, July 3—KECA, 11:15 a. m. Subject: Health Talk.

Saturday, July 7—KFI, 9 a. m. Subject: Health Talk.
Saturday, July 7—KFAC, 10 a. m. Subject: Your Doctor and You.

Tuesday, July 10—KECA, 11:15 a. m. Subject: Health Talk.

Saturday, July 14—KFI, 9 a. m. Subject: Health Talk.
Saturday, July 14—KFAC, 10 a. m. Subject: Your Doctor and You.

Tuesday, July 17—KECA, 11:15 a. m. Subject: Health Talk.

Saturday, July 21—KFI, 9 a. m. Subject: Health Talk.
Saturday, July 21—KFAC, 10 a. m. Subject: Your Doctor and You.

Tuesday, July 24—KECA, 11:15 a. m. Subject: Health Talk.

Saturday, July 28—KFI, 9 a. m. Subject: Health Talk.
Saturday, July 28—KFAC, 10 a. m. Subject: Your Doctor and You.

Tuesday, July 31—KECA, 11:15 a. m. Subject: Health Talk.

New York Polyclinic Medical School and Hospital. Dr. J. Eastman Sheehan has been appointed professor of plastic reparative surgery at the New York Polyclinic Medical School and Hospital, and a department has been organized for postgraduate teaching in this subject.

Dr. Sidney V. Haas has been appointed professor of pediatrics at the New York Polyclinic Medical School and Hospital.

Dr. James P. Croce has been appointed clinical professor of internal medicine at the New York Polyclinic Medical School and Hospital.

* County societies giving medical broadcasts are requested to send information as soon as arranged (giving station, day, date and hour, and subject) to CALIFORNIA AND WESTERN MEDICINE, 459 Sutter Street, San Francisco, for inclusion in this column.

Some Important State Election Dates:

July 17—Last day for filing initiative petitions. One hundred and eleven thousand valid signatures are required to place an initiative measure upon the ballot.

July 18—Last day for registration for the primary election.

August 28—Primary election.

September 27—Last day of registration for the general election.

November 6—General election.

Query—Are you registered?

American Board of Ophthalmology.—The American Board of Ophthalmology will this year conduct a special examination at the time of the meeting of the Pacific Coast Oto-Ophthalmological Society in Butte on July 16, and to accommodate those who cannot go to Butte an examination will be held at San Francisco about July 25.

The fee for the examination and the certificate is \$50. Of this sum, \$25 must accompany the application and the balance must be paid when the certificate is ready for issuance. No refunds are made. If the candidate fails in an examination he will be permitted to take a second examination within three years without additional fee.

Dr. William H. Wilder, 122 South Michigan Avenue, Chicago, is the secretary of the board, from whom application blanks and all necessary information may be obtained.

CORRESPONDENCE

Subject of following letter: Regulating payment of vouchers for medical services rendered to injured Civil Works Administration employees.

Federal Civil Works Administration for
California

49 Fourth Street
San Francisco

Edward Macauley, Administrator

June 25, 1934.

To the Editor.—As per our telephone conversation with Secretary Pope of the California Medical Association this morning, I am attaching hereto a bulletin from the United States Employees' Compensation Commission and ask that you give it as wide publicity as possible throughout your Association. Also if you know of any means whereby you can reach the non-members of your Association, I would appreciate their being contacted also.

It is requested that the bulletin be printed verbatim and that my name and title be used as authority for the dissemination of this information.

I would also appreciate it if you could get word at the same time to the doctors, hospitals, nurses, medical supply houses and drug stores not to communicate direct with the Commission in Washington regarding their bills. Any person or firm has a right to do so, but it only results in loss of time since the Commission refers all matters back to my office for investigation. If a creditor insists on writing to Washington,

he will greatly oblige if, at the same time, he sends us a copy of his letter and/or bill and in all cases the name of the injured employee should be connected with the claim, since it is by use of an alphabetical file containing the name of all injured CWA employees that we can find a case.

We are making every effort to clean up the 12,000 California CWA Compensation cases as speedily as possible. In justice to the men who have compensation coming we have given their cases priority, and the medical vouchers connected with these cases will naturally be paid first. This leaves the cases involving medical expense only to the last, but I think you will agree that this was the most humane way to handle the work since the injured employees were in such dire need of their compensation.

Yours very truly,

EDWARD MACAULEY,
Civil Works Administrator for California.

(Signed) By Bartle M. Harvey,
Insurance Officer of Civil Works for California.

✱ ✱ ✱

To All Persons Interested in the Payment of Vouchers for Medical Services Rendered to Injured Civil Works Administration Employees:

A certain amount of delay in the settlement of vouchers for medical services rendered injured employees of the Civil Works Administration is unavoidable. Legislation extending compensation benefits to these employees was not approved until February 15, 1934, and the Commission has had to engage personnel and set up its organization to handle the large volume of additional work which is involved in the settlement of claims arising out of Civil Works employment.

Before approving vouchers for medical services, it is necessary for the Commission to have received from the local Civil Works Administrators complete reports relating to the injury of the employee concerned. Since the entire work program was organized very quickly, some localities were slow in setting up the necessary local administration to take care of injury reports, and due to unfamiliarity of the personnel with the requirements and procedure, many reports of injury have been incorrectly filed, necessitating correspondence to obtain the information which was lacking.

In view of the problem presented, the Commission bespeaks the patience of physicians and others who have bills for medical services pending. Every possible effort is being made by the Commission to speed up the work of examining and certifying these claims for payment, and it is believed that within a short time considerable progress will be made in further expediting these payments.

U. S. EMPLOYEES' COMPENSATION COMMISSION.
Bartle M. Harvey,
Insurance Officer of Civil Works for California.

Subject of following letter: Comments on the paper, "The Challenge of Allergy in Medical Practice" printed in the May "California and Western Medicine":

May 25, 1934.

To the Editor:—I would appreciate it very much if you would publish the following discussion of a paper entitled "The Challenge of Allergy in Medical Practice" by Dr. Albert H. Rowe, which appeared in the May number of CALIFORNIA AND WESTERN MEDICINE:

"This paper demonstrates the widely divergent views pertaining to the subject of allergy, most workers in this field not being in accord with the author that so many diseases of mankind are allergic. It is true that many allergic conditions are overlooked, for example, mild vasomotor rhinitis and hay fever, which are seen so frequently in children and considered common

colds. On the other hand, one must not let the enthusiasm of the specialist run away with one's critical acumen.

"The author's statement that bronchial asthma in children is usually due to a food sensitivity is not in accord with our own experience in that, in a study of over fifteen hundred children completely and thoroughly tested, only one in one hundred reacted to foods alone, while 80 per cent were multiple sensitive to foods and other substances such as pollen, epidermals, etc. It is not unusual for infants to be sensitive to the inhalants alone—perhaps not as frequently as with foods.

"The general experience of most workers in the field of asthma as regards the diagnosis 'bacterial asthma,' is that such diagnosis is arrived at by a process of elimination. The diagnosis is a negative one, and only presumptive of a bacterial etiology, since as yet there has never been scientific proof of the existence of such a clinical entity. Those whose work would indicate the contrary of this are open to the criticism that the production or relief of attacks of asthma by the injection of bacterial substances have not proved that such reactions are specific in nature.

"We are thoroughly in accord with the author that in arriving at correct diagnosis the taking of a careful and searching history from the patient as to heredity, occupation, environment, clinical history and the various laboratory studies such as blood, x-ray, and lastly and most important, protein testing, are necessary.

"The treatment is primarily dependent upon determination of a specific etiology, as the author points out. The results of treatment are dependent upon the close cooperation of patient and physician and the realization that this condition is usually a chronic and constitutional one requiring considerable time and patience on the part of the allergic individual and clinical skill and ingenuity on the part of the physician, and finally, that allergic disease cannot be treated by stereotyped methods, each individual being a problem in himself."

Very truly yours,

GEORGE PINESS, M. D.

Subject of Following Letter: A protest by the Human Betterment Foundation of California regarding a movie film:*

To the Editor:—There is now circulating in the United States, put out by the same producers as "Elysia," the nudist colony movie, a motion picture entitled "Tomorrow's Children," which professes to tell the "truth about sterilization." It is entirely misleading, and tends to scare people as to the administration of a sterilization law, under fictitious conditions which we feel sure could not occur in any American state. The advertising that has appeared in the newspapers is even more objectionable than the general tone of the film. Some effort ought to be made to present a correct statement of the facts to the public of any city where the film is shown.

If it should be shown in your city, would it not be possible to send statements to the newspapers, in order to call attention to the fact that this film is misleading and unfair to sterilization? We believe such action on the part of responsible local persons would have a very valuable influence in preventing the growth of prejudice against the proper administration of sound and well-protected sterilization laws in the United States.

Cordially yours,

HUMAN BETTERMENT FOUNDATION.

By E. S. Gosney, President.

Pacific Southwest Bldg., Pasadena.

* For two articles on topic, "Who Should Be Sterilized," see JUNE CALIFORNIA AND WESTERN MEDICINE, page 429, and this issue, page 54.

POLIOMYELITIS

Los Angeles County Hospital Staff Resolutions

At a special meeting of the Medical Advisory Board of the Attending Staff of the Los Angeles County Hospital, held on Friday, June 15, to consider poliomyelitis conditions confronting the hospital, the following resolutions were introduced by Dr. George H. Kress and were unanimously adopted. They are given space here because they may have suggestive value to staffs of other hospitals in which somewhat similar complications may arise. The principles embodied in the following resolutions are also discussed in this issue on page 50:

RESOLUTIONS

WHEREAS, An epidemic of poliomyelitis (infantile paralysis), of wider prevalence than in past years now exists in California, with the largest number of cases at the present time in Southern California; and

WHEREAS, Excluding poliomyelitis patients already treated and discharged at the Los Angeles County Hospital, there are now in the institution over three hundred in-patients with proved poliomyelitis, and about two hundred in-patients under suspicion for the same disease; and

WHEREAS, A total of some five physicians and thirty nurses have contracted poliomyelitis while on present duty at the hospital (several of these being interne physicians and student nurses); and

WHEREAS, It is only proper that the health and lives of the physicians, nurses, and others in attendance on these patients should be taken into as full account as the health and lives of the patients themselves; now, therefore, be it

Resolved, By the Medical Advisory Board of the Attending Staff of the Los Angeles County Hospital at a special meeting held on Friday, June 15, that in the opinion of the members of that board the following steps should be taken by the constituted authorities:

1. That needed quarantine procedures be stringently observed by all who enter or work in the poliomyelitis wards of the County Hospital.

2. That no interns or student nurses be placed on service in such wards unless provisions be made that in case of infection they shall be immediately given salary registrations that provide them with adequate protection through the State Compensation Law.

3. That all registered nurses be on salaries sufficient to have the State Compensation Law adequately protect them.

4. That in similar manner, if additional medical aid is needed, that this be secured, if possible, through the employment of interns and registered physicians from the ranks of private practice, at adequate salaries.

5. That the personnel having the care of these patients be sufficiently large so that doctors, nurses, and others be not required to work to the point of such fatigue as to predispose them to infection, and that the hours of work be regulated accordingly.

6. That all personnel in attendance upon these patients be given the opportunity to receive, if they so wish, prophylactic treatment with sera, to be prepared according to the accepted procedures, as may be necessary; and be it further

Resolved, That this Medical Advisory Board directs that copies of these resolutions be sent to the following:

To the Board of Supervisors, and each member thereof;

To the Los Angeles Chamber of Commerce, and a copy to the president and secretary thereof;

To the California State Board of Health;

To the Los Angeles County Medical Association.

Poliomyelitis Symptoms

"Poliomyelitis Symptoms," prepared in an abbreviated form by George Parrish, M. D., health officer of the city of Los Angeles, appear below.

The City Health Department emphasizes the necessity of an early diagnosis and report.

INCUBATION PERIOD: Rarely less than six, nor more than eighteen days, usually seven to fourteen days.

TYPES OF ONSETS: Much the same in all types. May be just as severe in the abortive and non-paralytic as in paralytic. Vast majority of cases abrupt. Rarely insidious (cold). Three types on onset:

1. Out-of-the-blue paralysis—rather rare.

2. Systemic infection gradually and uninterruptedly involving the central nervous system.

3. Dromedary type.

SYMPTOMS: Headache (constant) fever (constant), vomiting, constipation (diarrhea).

Fever: No characteristic curve; last four to ten days; falls by lysis, occasionally by crisis.

Pulse: In proportion to fever. Rapid rate—Bulbar paralysis.

Respiration: With pulse and temperature. Rapid rate bulbar involvement.

Hyperesthesia: More diagnostic as an early symptom even than the fever; may be quite general and elicited by lightest touch or deep pressure; more marked over spine and large nerve trunks. Hyperesthesia and anesthesia practically never occur.

Pain in Neck.

Extreme Drowsiness, alternating with irritability when disturbed. Pain in extremities presages an oncoming paralysis. Neuritic pains common.

Tremor or Twitchings of muscle groups, occasional early symptoms.

Convulsions: Rare—in more recent epidemics.

Meningeal Symptoms occurring early are antero-posterior:

Stiffness of neck and especially of the back.

Often a moderate Kernig's sign.

Positive Brudzinski's sign.

Positive MacEwen's sign.

Changes in reflexes.

Profuse sweating often an early symptom.

CLASSIFICATION OF POLIOMYELITIS

1. The spinal poliomyelitis form.

2. The meningitic.

3. The encephalitic.

4. The form resembling Landry's paralysis.

5. The abortive.

6. The bulbar or pontine form.

7. The ataxic.

8. The polyneuritic (resembling neuritis).

Subject: Salary Ordinance—Emergency amendments to provide Workmen's Compensation for nurses and doctors on poliomyelitis wards who now receive maintenance only or nominal pay with maintenance. A letter to the Los Angeles Board of Supervisors.

The Honorable Board of Supervisors, County of Los Angeles, Addressed.

Dear Sirs:

"In caring for poliomyelitis patients on our isolation wards a number of our workers have, unfortunately, contracted the disease. The total number of those afflicted to date is thirty-two, representing various employee groups as follows: Resident physicians, three; internes, two; graduate nurses, fourteen; student nurses, nine; attendants, two; ambulance driver, one; kitchen worker, one. Considering that during the past thirty days over five hundred poliomyelitis patients have been received at the hospital and that on some days the admissions of actual or suspected cases have numbered sixty or more, these incidences of infection were probably unavoidable under the circumstances due to the humanly impossible task of providing in

such great haste a force of workers trained to handle this highly contagious disease without danger to themselves.

"Insofar as the illness of these workers is determined to have been contracted in the performance of duty, they are entitled to medical care and compensation as provided by law. At present, and for some time past, this compensation, in cases of contagious disease, has been determined and allowed from month to month by action of your Honorable Board, but the new Salary Ordinance, No. 2473 N. S., effective July 1, 1934, provides that after that date the State Workmen's Compensation Law shall govern such cases. This gives proper protection for those who receive an adequate salary, but for resident physicians, interns, and student nurses, who receive only full maintenance plus a nominal monthly cash allowance, the Workmen's Compensation Law would afford such meager and inadequate relief as to be negligible and unjust. While it is estimated that in this epidemic only about 30 per cent of those ill with poliomyelitis will suffer paralysis and only about one-half of this number will be afflicted with permanent disability, it is nevertheless of the utmost importance that these young doctors and nurses be protected to a degree commensurate with the ordinary evaluation of their services as professional workers.

"I believe that this measure of protection can be provided for these afflicted workers through the creation of new item numbers parallel with those on which they are now employed and carrying a salary equal to that provided for workers in their respective classifications who have completed their student or apprentice service. These items would be used only for the benefit of students or apprentice workers who become afflicted with poliomyelitis (infantile paralysis) as the result of employment on the wards or clinics of the hospital and would not apply to any other contagious or non-contagious disease. I believe that about 40 per cent of each group of doctors and 25 per cent of student nurses on non-salaried or nominally paid item numbers should be provided for through the proposed parallel new item numbers at normal salary.

"In line with this plan I hereby respectfully recommend that your Honorable Board amend Section 18 of Ordinance 2101 N. S. by the adoption of an emergency ordinance, effective immediately, to authorize the following items: . . .

"No additional appropriation for salaries and wages will be required by these amendments, inasmuch as any compensation payable under these salary provisions would be paid out of the Workmen's Compensation insurance fund." . . .

Paralysis War Needs Doctors

Under the above caption the Los Angeles Examiner of June 20, printed the following item:

With the number of infantile paralysis cases under treatment at the General Hospital increasing yesterday from 324 to 360, the need for additional nurses and physicians became more pronounced, hospital attachés declared.

Ten physicians and forty nurses at the hospital have contracted the disease during their desperate fight to stem its tide, it was stated. Immediate replacements for the stricken medical men and nurses are required.

Meantime, Mr. Norman R. Martin, superintendent of the General Hospital, where most of the infantile paralysis cases have been isolated, was awaiting the Board of Supervisors' action on his request for authority to employ fifty nurses for emergency duty.

Health department figures released yesterday showed thirty-five new cases in the city proper and twenty-nine in county territory for the forty-eight-hour period ending Monday.

Since January 1, there have been 331 cases in the county and 525 in the city; since May 1, 307 cases in the county and 496 in the city.

Excerpts from Report Secured from the Los Angeles District, California State Nurses' Association

Because the element of fatigue may play a considerable rôle in favoring infection with poliomyelitis, it

may be proper to quote from a report dated June 18, which was received from an officer in the Los Angeles district of the California State Nurses' Association, relative to work hours and compensation of nurses at the Los Angeles County General Hospital. It is understandable why nurses are reluctant to go to the County Hospital if the hours are long and irregular, the work hard, and no definite assurance at the time of the above date, of proper compensation in the event of paralysis disability following possible infection from poliomyelitis. Quotation follows:

"The information obtained from the Official Nursing Bureau is as follows:

"The Bureau has a total of 1,037 registrants (May 31). The majority are graduates from California schools. The number who have had training or experience in contagious disease nursing is not known. It is planned to secure this information as memberships are renewed; this will begin January 1, 1935.

"During the period of this epidemic it has not been possible for this office (the Nursing Bureau) to supply as many nurses as were required for general duty in the Los Angeles County General Hospital because:

"1. Nurses had not had contagious disease training or experience and were 'afraid';

"2. They had small children at home and were afraid of carrying the infection;

"3. Nurses found the work too hard;

"4. They were unwilling or were unable to endure the work over broken hours—as some were required to work from 7 to 11 a. m. and return to work from 7 to 11 p. m. They would then be expected to return to duty at 7 a. m. the following day;

"5. Nurses were not willing to work for the wages offered. In the beginning of the epidemic these were the regulations:

"An eight-hour day (broken hours).

"A five-day week.

"No maintenance or car fare.

"Forty cents per hour.

"Later the regulations allowed:

"One meal.

"Fifty cents per hour; otherwise as above."

Poliomyelitis Suggestions From the Department of Public Health of the City and County of San Francisco

The following communications have been received from Director Geiger and are printed for their suggestive value to others:

June 19, 1934.

To the Laboratories of San Francisco: The Committee on Acute Anterior Poliomyelitis has recommended to the physicians of San Francisco that there is justification for the use of convalescent serum in the treatment of the disease and as a prophylactic to early contacts. In addition, the committee has advised the use of normal adult serum, pooled from groups of five to ten individuals, as a prophylactic to be given to direct contacts (and to others if ordered by the family physician). This type of immunizing procedure is obviously in the experimental stage and its value problematical.

These recommendations are based on the work reported upon in the literature of Flexner, Aycock, and others. It is believed that the present outbreak offers a rare opportunity for the compilation of data which will furnish evidence from which conclusions can be rather accurately drawn in determining the true value of convalescent and normal adult serum, as both therapeutic and prophylactic agents.

This communication is directed at the standardization of the technique of preparing the serum, and the following outline presents the technique followed in the laboratories of the George Williams Hooper Foundation for Medical Research, and is recommended as the desirable technique to be followed in all collect-

ing centers for the preparation of normal adult serum or for convalescent serum:

(NOTE—Application to Director Geiger will bring you a copy of the bulletin giving technique.) . . .

The distribution of normal adult serum for prophylaxis should be to physicians in vials containing 20 c.c. or small multiples of this amount, since the recommended dosage is 20 c.c.; but the convalescent serum package for treatment of the case should be of the 50 c.c. unit, since this is the therapeutic dosage recommended for the affected child, and multiples thereof in the affected adolescent and adult.

We are enlisting your coöperation in the collection and distribution of serum, with the particular request that the standard procedure be followed and that accurate records be kept. Only by a coördinated effort can we take advantage of this opportunity to meet the present emergency in an adequate, intelligent, and modern manner. We expect your participation, therefore, to this end.

Sincerely,

J. C. GEIGER, M. D.

Director of Public Health, San Francisco; Chairman, Committee on Acute Anterior Poliomyelitis.

THE RECOMMENDATIONS OF THE COMMITTEE ON ACUTE ANTERIOR POLIOMYELITIS, DEPARTMENT OF PUBLIC HEALTH, CITY AND COUNTY OF SAN FRANCISCO

June 18, 1934.

1. "San Francisco is faced with an outbreak of poliomyelitis. At the present time the disease exists to the extent of one case in each 20,000 of population.

2. "Experience shows that the blood serum from convalescent patients has value in the early treatment of the disease.

3. "It has been established that many adults have acquired an immunity to poliomyelitis. It is reasonable to suppose that the blood serum of these adults may have a temporary protective value when injected into susceptibles. The experimental evidence is merely suggestive, but by no means conclusive.

4. "There has been established at the Hooper Foundation Laboratories at the University of California, Montrose 3600, to collect process, and provide serum from convalescents for the early treatment of poliomyelitis. Convalescents from poliomyelitis who wish to offer their blood, communicate as above. This convalescent serum is necessarily limited in amount; therefore it should be used without exception only for the early treatment of patients with undeniable poliomyelitis.

5. "The committee recognizes that some authorities have suggested the injection of normal adult human serum for the protective immunization against poliomyelitis. Because of its possible value, the committee recommends the early use of this serum on known direct contacts. From the evidence available, the committee does not feel justified in recommending the use of this serum for mass immunization. The use of such adult serum should be left to the practicing physicians.

6. "The Department of Public Health will issue regulations for the proper processing of adult serum and its distribution from private laboratories to practicing physicians.

"Therefore, the Department of Public Health only advocates the immunization of contacts to frank cases of poliomyelitis. Such contacts should be offered this possible protection within forty-eight hours after last exposure to a case, and when such contacts are in the susceptible age groups, namely 5 to 20 years of age.

"The efficacy of this is by no means proven and these contacts must be carefully observed for the usual quarantine period of 21 days. Records of such infections must be kept and sent to the Health Department in order that the value, if any, be statistically determined."

J. A. M. A. (June 23) Comments on Poliomyelitis in California

The following is reprinted from the editorial columns of the June 23 *Journal of the American Medical Association*:

POLIOMYELITIS IN CALIFORNIA

"With the news spreading widely over the United States that there is an increase in the incidence of anterior poliomyelitis in the Los Angeles area, physicians everywhere are being besieged with questions as to whether or not it is safe to travel into that district and as to whether or not the incidence is sufficiently great to be termed epidemic. The number of cases is well beyond the average incidence of infantile paralysis in the community concerned and is, therefore, of epidemic proportions. No one can say just when the epidemic will reach its peak. The factors concerning the duration of such epidemics are not well established. Some epidemics in Southern California, according to information received from the United States Public Health Service, seem to extend over longer periods than elsewhere, and the curves have flatter tops than those of other similar areas. This does not necessarily mean a larger number of cases per hundred thousand of population.

"The incidence of poliomyelitis is higher than normal for Los Angeles or for any other California district, and it is not considered safe to send a small child into the vicinity. The danger, of course, is small in comparison with the danger from much more contagious conditions, but the danger is definite and should not be assumed if it is avoidable. A child under six years of age falls within the most susceptible age group and for this reason would be subjected to a special hazard if taken from a non-infected area into an infected area. It is, moreover, especially difficult to protect a child against contact with infantile paralysis, since the disease seems to be distributed by carriers, as are also scarlet fever and diphtheria, so that the child might become infected from a person who is apparently well. Epidemiology establishes the fact that infantile paralysis, like epidemic encephalitis, clears up with the coming of cold weather. In the Los Angeles area the first really cool weather may not be expected until November or December.

"Considerable agitation is apparent among parents as well as among physicians for mass immunization of the apparently well child, not only in the Los Angeles area, but also in San Francisco and in adjacent cities. Whole blood or convalescent serum is suggested for prophylaxis. A survey of the available evidence indicates that neither of these methods has been used to a sufficient extent in well-controlled experiments to provide data of value, either in favor of or against its efficiency. In measles, convalescent serum seems to have value, and, with the certain knowledge that antiviral substances for poliomyelitis exist in the serums of adults and of recovered cases, the prophylactic use would seem to be rational and might be given a trial in children who are unavoidably exposed to the epidemic area. However, the period during which such protection might continue from a single injection is not known. If such experiments are made, records should be accurately kept, as the information will be of exceeding value in determining future practice."

Los Angeles Poliomyelitis Morbidity Up to
June 26, 1934

Excerpts from *Los Angeles Herald*, June 26, 1934:

UNITED STATES EXPERTS MAY AID WAR ON PARALYSIS

"Aid of federal public health technicians in combating the spread of infantile paralysis here may be requested by Dr. J. P. Leake, poliomyelitis expert, who arrived here from Washington Sunday, it was announced today.

"Doctor Leake conferred with city and county health officers yesterday in preparation for his work of investigating the epidemic here.

"Dr. Edward C. Rosenow of the Mayo Foundation is expected in the city today to aid in the study of the disease. Doctor Rosenow is a nationally known authority on poliomyelitis.

"New cases reported yesterday make a total of 447 in the city and 270 cases outside the city for the month of June, a total of 717 cases.

"In May, there were 176 cases in the city, and 107 in the county outside the city, a total for the month of 283 cases.

"The total since the first of the year is 650 in the city of Los Angeles and 389 in the county of Los Angeles outside the city, a total of 1,039 for the epidemic.

"A slight increase in the number of poliomyelitis patients in the communicable disease ward of the General Hospital was recorded today, with fifty-four new patients admitted, (twenty-eight from the city) and thirty-six discharged. This represents an increase of eighteen. There are now 334 cases under treatment, with 195 suspected patients, including five 'contacts.'"

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Vol. VII, No. 12, July, 1909

From Some Editorial Notes:

The American Medical Association Meeting.—The annual meeting of the Association, held this year at Atlantic City, was remarkable only for the fact that it seemed to crystallize the general feeling of approval of those policies of the Association which have brought forth such a deluge of criticism from certain questionable quarters. . . .

The New Officers.—When it came to the election of officers, there seemed to be even more than usual unanimity of opinion in the American Medical Association House of Delegates. There was no contest over any office save that of one of the vice-presidents, and in this instance the feeling was entirely friendly. Dr. William H. Welch of Johns Hopkins was the unanimous choice for president; he has served the Association for a number of years as a trustee and has the confidence and respect of every member of the Association. . . .

Place of Meeting.—The delegates from California to the House of Delegates of the American Medical Association did everything in their power to secure the election of Los Angeles for the place of the next annual session; but it was not to be. . . . So St. Louis was chosen. But the probabilities are that, should California extend an invitation next year, the Association will come to our state. It last met in California in 1894.

Gather Energy.—Just because it is summer time, and vacation time, don't let all your interest in and enthusiasm for your society work dissipate into thin nothingness. Remember that it is up to our medical organizations to see that the people of this state get proper public health laws and proper protection. . . .

Take a Vacation.—That is just what the editor is going to do, and what he advises every one of you to do; take a real vacation, even if it is for only ten days or two weeks. . . .

From an article on "Fat as a Disturbing Factor in Infant Feeding" by Langley Porter, M.D., San Francisco.

The disturbances due to fat may be classed as disturbances in the breast-fed and disturbances in the bottle-fed. These disturbances may further be divided into those evidenced by indigestion, either gastric or intestinal, and those evidenced by disturbances of metabolism. . . . With Doctor Chipman I have seen one such case, which died in the Lane Hospital, and one other was referred to me by Dr. Walter Coffey.

The Interrelations of Glands with Internal Secretion.—Since Brown-Séquard, guided by the fatal results of the extirpation of the suprarenal glands, first established the idea of internal secretion, the physiological and clinical significance of the function of the ductless glands has been the subject of great controversy. . . . Clinical and experimental data pointed to the fact that the product of these internal secretions regulated cer-

* This column strives to mirror the work and aims of colleagues who bore the brunt of society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and new members.

(Continued in front Advertising Section Page 12)

BOARD OF MEDICAL EXAMINERS OF THE STATE OF CALIFORNIA*

By CHARLES B. PINKHAM, M. D.

Secretary-Treasurer

News Items

"The Grand Jury's attack on alleged racketeers in health protective societies received a new impetus today, when indictments were returned against H. N. Duhem, head of the Associated Health Service, and Dr. A. M. Ryan, listed as a medical employee of the organization. Two alleged victims of the society were named—Mrs. Dora Brady, 29 Belcher Street, and Vida J. Knoll, both of whom were denied aid, after paying their membership dues. . . ." (San Francisco *Call-Bulletin*, June 1, 1934.)

"Two more indictments growing out of the so-called 'health racket' were voted by the County Grand Jury last night. Those named in the indictments were L. V. Reed and Joe Bloom, manager and salesman, respectively, of the United Health Services, with offices at 209 Post Street. The charges were conspiracy to obtain money under false pretenses. Several witnesses were presented by Leslie C. Gillen, Assistant District Attorney, in charge of the Fraud Bureau. Meanwhile, from Sacramento, according to the Associated Press, came word that R. A. Sewall, sought since December in connection with the 'health racket' in Oakland, was arrested in a rooming house in that city last night." (San Francisco *Chronicle*, June 8, 1934.)

"The Federal Trade Commission charges the Bayer Company, Inc., of New York today with misrepresentations in the sale of its aspirin tablets. The Commission said, 'There are some persons by whom Bayer tablets may not safely be taken, even in small or moderate doses.' The company is given until July 13 to show why the Commission should not issue an order requiring the company to desist from alleged misrepresentations. The Commission's announcement said: 'Among the practices are representations in advertising tending to mislead the ultimate buyers into believing that only Bayer aspirin is genuine aspirin, that aspirin sold by its competitors is not aspirin, is not as beneficial to the users as Bayer's aspirin and is counterfeit or spurious.' (Associated Press dispatch, dated Washington, June 13, 1934, printed in the *Sacramento Bee*, June 13, 1934.)

"A chiropractor by any other name is still a chiropractor, Attorney-General U. S. Webb ruled yesterday. He informed C. C. Hunt, secretary of the State Board of Chiropractic Examiners, that Wilbur W. Walp, who had signed a death certificate in Los Angeles as a 'chirothesian,' may be prosecuted for practicing chiropractic without a license." (San Francisco *News*, June 15, 1934.)

"Radio advertising must broadcast truthful assertions and eliminate misleading, extravagant claims, the Federal Trade Commission ruled today. The Commission declared the same standards would be applied to radio advertisers that long have been exacted of newspaper and magazine advertisers. It made public a letter to broadcasting stations, which said: 'Whenever statements occur in commercial announcements which appear to be false and misleading or otherwise constitute an unfair method of competition in com-

* The office addresses of the California State Board of Medical Examiners are printed in the roster on advertising page 6.

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